



إيلامس للإنارة
ELAMES LIGHTING

A division of



مجموعة بهزاد
BEHZAD GROUP

OUR STORY

Elames Lighting BSC established in 1995 is a division of Behzad Group in the Kingdom of Bahrain. Since then, Elames Lighting has partnered with and supplied various projects of different sizes nationally and internationally. We supply both internal and external lighting, as well as technical and decorative products. Our projects include hotel, palaces, commercial offices, government, showrooms, residential buildings and private villas.

Our modern showroom serves the needs of designers and private customers alike; and displays hundreds of products from dozens of high quality providers in Europe and around the world.

Our team is proud of the service we offer, we constantly update our showroom in line with the latest technologies and expand our product range to not only meet, but surpass our customers' requirements.

AREAS OF SPECIALTY



Domestic lighting



Hospitality interior lighting



Façade lighting



Retail outlet interior lighting



Landscape lighting



Highway & street lighting



Stadium & floodlighting



Stage lighting & entertainment lamps



Light Bulbs



Emergency lighting



Switches & sockets



Obstruction lights



Hazardous area lighting



Hospitals, schools & offices - interior lighting



Industrial interior lighting



Solar lighting



Art lighting



Automation Control System



We work hand in hand with our clients to understand project needs and goals, with the ultimate aim of achieving a unique and cost effective solution that exceeds all envisaged expectations.



Domestic Lighting

Whether you are looking to build, move to a new home or simply just planning to renovate, our team can take care of all your lighting needs. Elames Lighting offers a range of solutions that can transform each room to complement your specific style and need.

Elames Lighting is committed to continue leading the way in providing the very latest developments in the fast changing field of lighting.

Design advice is available and our expert staff ready to discuss. Top European brands as well as economic solutions - make Elames Lighting your one step shop for lighting!





Hospitality Interior Lighting

Elegance, practicality and efficiency are the winning formula to hotel lighting. Our lighting department helps set the right mood with a combination of lights that serve decorative as well as functional needs, all within a cost effective framework.

Elames has developed a trust worthy name in the industry through a successful project record and by working with a broad range of quality manufacturers, designers and contractors. All of which enables us to offer creative, unique and cost effective options for each installation or refurbishment.

We offer our guidance through a complete process from design, cost consultancy, value engineering, supply and install if required.



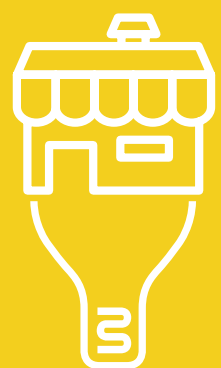


Façade Lighting

If you are looking for classic lighting or creating a genuine landmark using ultra-modern architainment features, Elames has long been at the forefront of this exciting development. Partnering with some of the best names in façade lighting, we can offer any solution, including dynamic colors LEDs, video walls and building contour lighting.

We can handle anything and everything, from concept, designing, supplying, managing projects to supervising the installation. We also make sure about programming and commissioning special events. We have worked on some of the most iconic buildings in Bahrain and the GCC and we are committed to continue leading the way in providing the very latest developments in the fast changing field of facade lighting.





Retail Outlet - Interior Lighting

Regardless of the product one is trying to sell, lighting play an important part of the buying process. Elames Lighting can help provide both technical advice, creative designs, supply and installation of lighting that is guaranteed to help meet the needs of specific retailer's needs. We possess a range of different fittings, bulbs and designs to achieve the optimum color rendition; this helps us to provide optimal lighting materials from the most accomplished manufacturers to any retail showroom.





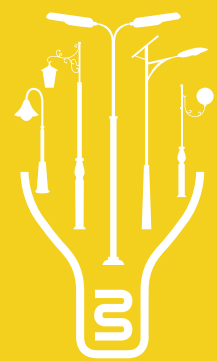
Landscape lighting

With the increasing demand for more efficient lighting, increasing availability of sustainable designs, global warming considerations, and safety concerns in garden and landscape design, Elames methods and equipment of outdoor illumination have been evolving throughout the years. The increasing use of LEDs, low voltage fixtures, energy efficient lamps, and energy-saving lighting design are examples of innovation in the field which we can offer.

We are confident that we can design and supply amazing cost effective solutions that is guaranteed to light up any space or features to whatever theme or specification required.

We also developed complete offer of solar outdoor lights.





Highway & street lighting

Statistics have long shown the vital contribution that highway and street lighting plays in increasing safety, reducing accidents, fatalities and injuries. New low maintenance, low energy technology has given a new impetus for more cost effective installations as well as many new eye catching designs, making the humble lamp post more like street art. LED and Solar Power advances in coming years will continue to make Highway and Street Lighting more affordable and Elames Lighting will always strive to offer the very latest options.

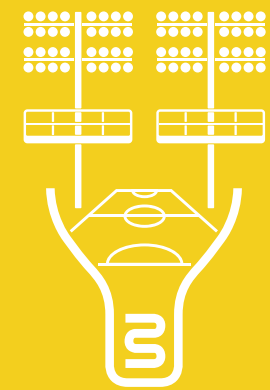
In order to provide the latest technologies we now offer solar panels street lights.





Stadium & floodlighting

Floodlighting covers a wide range of applications from the very specific requirements for lighting stadiums, sports arenas and stage entertainment to the varying aspects of lighting areas such as marshaling yards, dockside operations, freight forwarding facilities, car parks and secure or military compounds. Whatever the application, we can provide quality products to achieve the required light levels, light distribution and colour rendition including options incorporating the latest energy saving technology.





Stage lighting & Entertainment lamps

We are familiar with lighting equipment theoretically and practically. Lighting design technologies operate lighting equipment with an emphasis on theatre specific practices and their applied techniques.

Successful productions are the result of close teamwork, as is getting the right lighting solution. With today's growing trend of integrating LED walls in stage lighting design, a new generation of lamps with more powerful beams is required to cut through the sea of homogenous light they provide – and add additional accents to the show.





Light Bulbs

LED light bulbs can save you time and money while providing unparalleled light. Use LED light bulbs to bring more light into the space, or shift the color to a warmer or cooler light. Choose from a full range of lamp types to fit your needs.

Elames is ready to supply different kind of bulbs. We highly recommend LED solutions, as could save up to 85% energy compared to conventional lamps, and enjoy longer life, perfectly suitable for places difficult to access.

Elames also supply all range of filament retro bulbs, crystal candle and many others less common on the market.





Emergency lighting

Combining proven technology with modern and aesthetic designs, the range offers high quality products at cost effective prices. We are committed to continue to expand our range and set a benchmark for quality and value in the region.

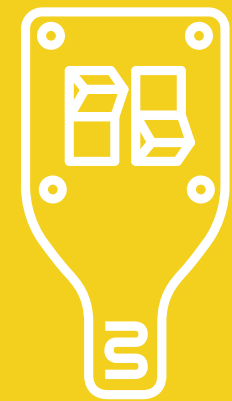




Switches & sockets

Luxury, elegance and sophistication: these are the traits that have inspired our decorative collections of switches. Each collection is a decorative masterpiece, expertly designed, handcrafted from the best materials and skilfully finished.

Economy, design and practicality would describe our standard range of switches, with complete solutions for both homes and hotels..





Obstruction lights

An increasingly important and complex area of lighting with very specific requirements for structures such as tall buildings, oil & gas rigs and communication towers as well as other specialist lighting installations such as helicopter landing pads. Elames Lighting is capable of offering complete solutions from leading specialist manufacturers, guaranteeing compliance with the regulations regardless of the application.





Hazardous area lighting

Elames Lighting is a leading supplier of high quality explosion proof lighting products for use in hazardous industrial areas and marine environments. Meeting the highest demands of project specifications we can provide a range of products that comply with international standards and safety regulations.





Hospitals, schools & offices – interior lighting

Installation of lighting within hospitals, schools or offices requires certain specifications to ease eye strain, aid concentration and performance during our time spent in classrooms, offices or any other working environment such as hospitals and laboratories. Sourcing products from certified manufacturing partners coupled with in house design, Elames can help create comfortable and productive working environments with a range of low maintenance, energy saving solutions available.

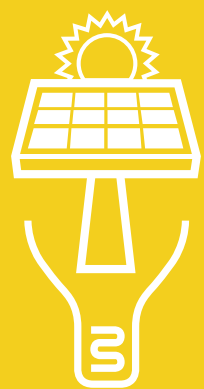




Industrial interior lighting

At Elames, we understand that each industrial premises requires different lighting setup. That is why we ensure having wide variety of lighting solutions available which enables us to offer full spectrum of options that meets legal requirements, provides optimum lighting and raise employee comfort levels. Whether its a new setup or retrofitting your current building, we can assist you with solutions that reduces energy consumption, low maintenance and cost effective.





Solar lights

The main source of light on the earth is the sun.

In order to support environmental program, can provide a complete solution for light into energy.

We offer street lights, garden landscaping, outdoor lights solutions to help you reduce costs and support environment.

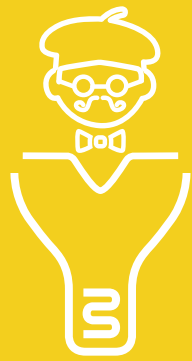


Art lighting

TILES LIGHT

Three-dimensional patterns improved the design of interiors and exteriors decorative lighting and provide depth and intensity to the spaces, enriched by the unique elegant and luxurious ambient lighting of porcelain.



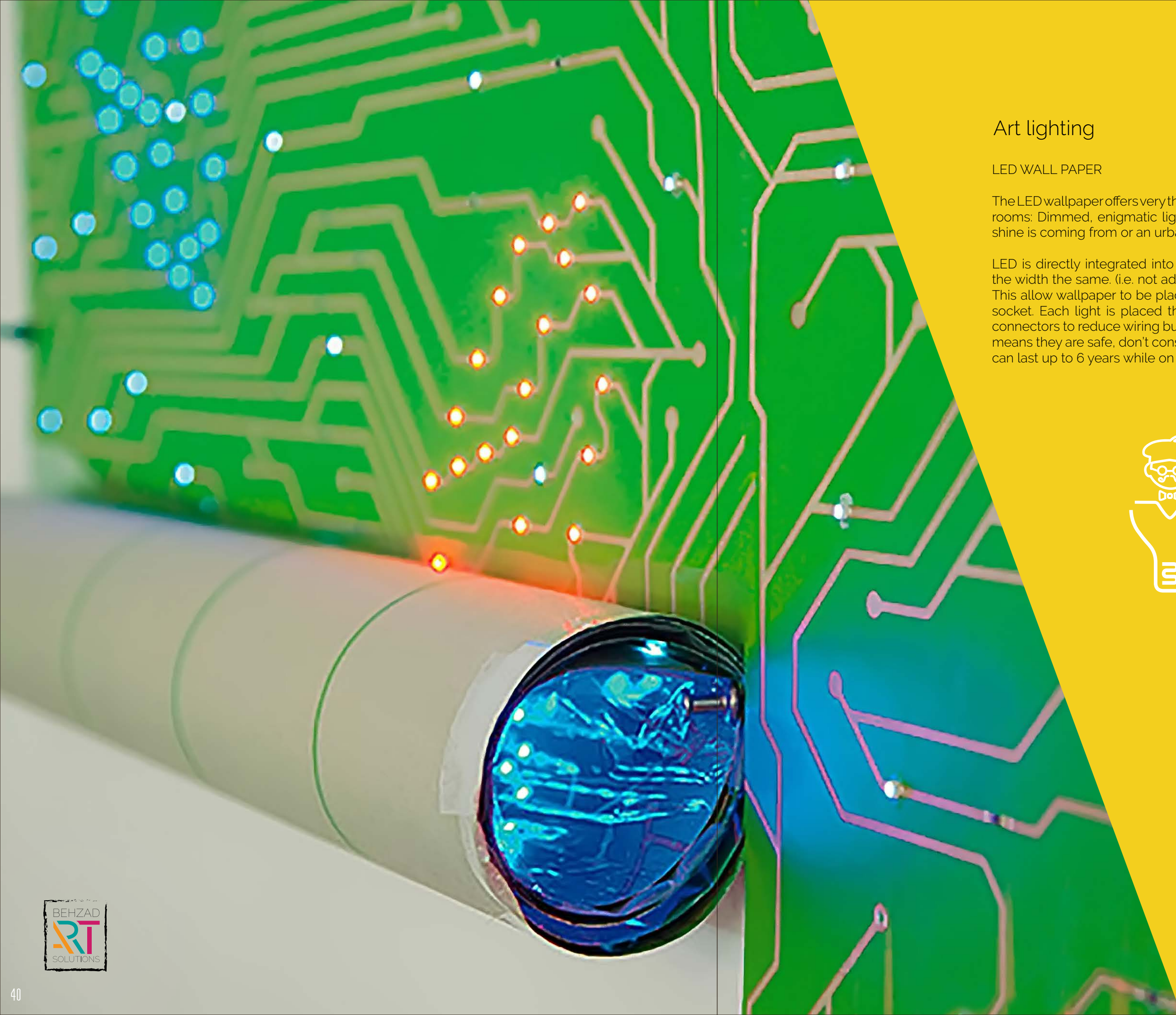


Art lighting

Light can be a form of artistic main medium and expression. An art sculpture could produce a light or light could be used to create using colours and shadows. Sculpture can be temporary or permanent.

Our Behzad Art with Elames Lighting can provide custom made solutions integrating art with architectural space.



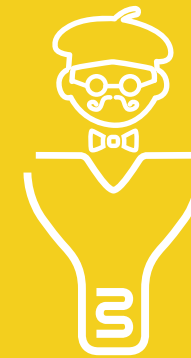


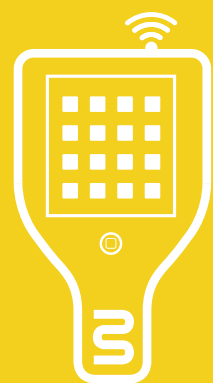
Art lighting

LED WALL PAPER

The LED wallpaper offers very thrilling possibilities to illuminate rooms: Dimmed, enigmatic light hardly revealing where the shine is coming from or an urban vibrating atmosphere.

LED is directly integrated into the wall paper while keeping the width the same. (i.e. not adding any more thickness to it). This allow wallpaper to be placed with the addition of a wall socket. Each light is placed through a system of flat metal connectors to reduce wiring bulk. They are low voltage which means they are safe, don't consume too much electricity and can last up to 6 years while on for 24 hours a day.





Automation Control System

Connects objects like lights, washing machines, home cinemas to smart phones and tablets through the internet in order to remotely enable people to control the settings of almost all appliances in the home, with simple yet sleek user interface you can control or modify any aspect of your home from the comfort of your couch.



BRANDS

Since 1964 when the Duracell brand was introduced, the market for batteries skyrocketed. Over time, Duracell has extended their brand to include a broad range of renewable products. Jiawei Technology and Duracell partnered in 2013 to offer a full line of Duracell-branded LED lighting products. This partnership brings over 70 years combined experience in renewable technologies.

DURACELL
LIGHTING

More info...

Products



LED S-C4 is a company with over 40 years' experience in design, development and manufacture of lighting solutions, serving over 13,000 customers in 140 countries around the world. Our company operates in all lighting segments, indoors and outdoors alike. We are well-known thanks to our high flexibility concept to offer ad hoc solutions for specific needs.

More info...

Products

Located in Huzhou, China, Jingri Lighting is an industry-leading designer and manufacturer of architectural, landscape and roadway luminaires with a focus on the advancement of LED technology and digital lighting control.



More info...

Products



Onok was founded in 1994 as a high quality lighting components manufacturer. Onok fast became one of the leading companies in the Spanish markets. Onok is specialised in the design, manufacturing and distribution of technical lighting for indoor and outdoor use, both in the domestic and exportation markets.

More info...

Products

Innovative new switches and electrical mechanisms with the latest developments in LED technology. FEDE sets the latest trends in luxury interior design with its limited edition light collections.



More info...

Products



GEWISS is a leading international manufacturer of systems and components for low voltage electrical installations. Its products include domestic devices to automatic safety switches, from distribution boards and enclosures to industrial connections, from trunking systems to lighting

More info...

Products

The company was established in Dublin in 1984 by Michael Stein. The LED Group is committed to meeting the needs of today's wholesalers and contractors through the ROBUS range of commercial, residential and retail fittings.



More info...

Products

As manufacturers of crystal components for the lighting industry, such as arms, scrolls, bobèche's, columns and bowls, we are able to supply and to help the best manufacturers worldwide to create their new collections every year.



More info...

Products



We manufacture high quality technical lighting in modern design at affordable prices. ONE Light supplies lighting to wholesalers in 62 countries.

More info...

Products

Disano Illuminazione was established in 1957 and today is a leading company in Italy and one of the top ranking companies in Europe for the production of lighting fittings.



More info...

Products



KINGLONG LIGHTING

Kinglong Lighting Co., Ltd. was founded in 1993 with registered capital of 50 million RMB. The company occupies a 200,000-square-meter plant with more than 1,200 employees and over 400 management and research elites.

More info...

Products

We are a solid and experienced lighting Group with a wide national and international presence, specialized in providing the best comprehensive solutions in design, production and marketing, to light architectural, professional, domestic and ephemeral spaces.



More info...

Products



Since its foundation in 1912, the medium-sized family company from the Sauerland-based Schalksmühle has established itself as a specialist for switches and systems. The modern solutions convince by comfort, safety and energy efficiency.

More info...

Products

Founded in Thailand in 1993 Unilamp has become the leading manufacturer of outdoor lighting and outdoor lighting applications and develop technologies that provide lighting expertise that delivers higher-value lighting environments with less energy.



More info...

Products



Cutting edge know-how in LED technology that guarantees quality, sustainability, and efficiency in any situation. A group of companies that is organised into a flexible network of technologies and skills, capable of dealing with each step of the process to create products for all demands with 100% Italian quality.

More info...

Products

Specialty is original architectural features, such as railings, stairways, tables, skylights, columns, and others. What characterizes them is a high proportion of manufacture with emphasis on precision and detail.



More info...

Products

Apavisa porcelanico, is the foremost manufacturer in the production and commercialization of high-technical porcelain. With representatives in more than 100 countries, apavisa offers the global market a constantly appropriate and accurate reponse, as well as a product that gives professionals and consumers the confidence that every major project needs.



[More info...](#)

[Products](#)

KARMAN

Experiment, dare, innovate. Karman world moves itself with simplicity towards an original and personal decorative use of lighting. From raw material to realizations, Karman collaborates with Italian companies and professionals.

[More info...](#)

[Products](#)

Huayi Lighting Company Limited was founded in 1986, and located in China Lighting Capital-GuZhen, ZhongShan City. After 30 years development, insisting upon Quality and Profession management strategy, the company comes into one of the outstanding lighting manufacturers in the industry.



[More info...](#)

[Products](#)



ZHONGSHAN KENIER LIGHTING CO.,LTD is a leading lighting manufacturer in china, which is located in Guzhen, the Lighting Center of China . Since its establishment in 1998, we are committed ourselves to R &D, manufacturing and marketing of the high-quality modern household aluminum wire lamps & crystal lighting products of European styles etc.

[More info...](#)

[Products](#)

Pulsar develops and manufactures electronic control and lighting systems that provide the core of many hi-tech installations around the world.



[More info...](#)

[Products](#)



Public design in harmony with the users, natural surroundings and architectural settings. A leading force on the international lighting market, Hess is a respected name for innovative, attractive outdoor lighting and premium street and site furnishings.

[More info...](#)

[Products](#)

Suoyoung Lighting locates at the lighting capital Guzhen town, Zhongshan city, Guangdong Province, China. It owns 30000 square meters for workshop and 400 square meters for showroom. We specialize in various kinds of modern, post- modern interior lighting, such as pendant lamp, table lamp, floor lamp, ceiling lamp, wall lamp, etc.



[More info...](#)

[Products](#)



Royal Contract Lighting is one of the largest lighting manufacturers in the United States, and offers sophisticated lighting design, superb craftsmanship, custom solutions, flawless installation and competitive pricing for hospitality clients worldwide.

[More info...](#)

[Catalogue](#)

The company was founded in 1953 by three brothers, Juan, José and Vicente Lladró, in the village of Almàssera near Valencia. Spectacular chandeliers, hanging, wall and table lamps. Lladró presents whole range of lighting ideas in varued styles to fill our favorite room with light.



[More info...](#)

[Products](#)

ERCO

ERCO is a leading international specialist in architectural lighting, using 100% LED technology. Founded in 1934, ERCO pioneered architectural lighting across Europe in the 1960s, and today, less than 50 years later, is the first established luminaire manufacturer with a portfolio based entirely on LED technology.

[More info...](#)

[Products](#)

Established in 2005, Zhongshan Haotian Electronic Co., Ltd.. is one of the biggest manufacturers of fire emergency lights around the world. Specifically, the main products include emergency lights, rechargeable lanterns, Emergency twin spots light, emergency exit lights, emergency conversion kits and electronic ballasts.



[More info...](#)

[Products](#)



Neo-Shine Lighting was established to create and supply different countries' people high quality, energy efficient & environmental friendly lighting products in 2004. Since established, Neo-Shine Lighting has been involved with the development, manufacturing, exporting of many different lighting products.

[More info...](#)

[Products](#)

Dilux Lighting Ltd was established in 2008 and is a member of Wah Wang Holdings (HK) Co. Ltd. which was founded in 1999 with headquarters located in Hong Kong. Dilux is a leading professional manufacturer and supplier of LED lighting products. Our products are exported worldwide, majority to Europe, U.S.A, Australia and Asia.



[More info...](#)

[Products](#)



Fast growing company born in Lyon, France, has managed to impose itself as one of the major European actors on the lighting market thanks to its numerous added services added to a global and wide offer of LED solutions.

[More info...](#)

[Catalogue](#)

We design and manufacture decorative lighting for domestic and commercial use, supplying retailers Nationwide. We have been established for over 75 years, and remain as close to our core values as we ever have: product design, service, reliability and customer satisfaction.



[More info...](#)

[Products](#)

WISDANDUN

Founded in 2000, Zhongshan Bomai Lighting Electrical Co.,Ltd. located in the Guzhen Town of Zhongshan-the city of lighting in the economically powerful Pearl River Delta of China. Our products include major series of lighting fixture, such as Pendant lighting, Chandeliers, Modern lamp, Crystal lamp, Ceiling lamp, Table lamps, Wall lamps, Floor lamps and Downlight.

[More info...](#)

[Products](#)

CSL has been designing and manufacturing performance-engineered architectural lighting fixtures since 1990. CSL continues to revolutionize the way architects and lighting designers perceive technical performance and energy efficiency with each new lighting innovation.



[More info...](#)

[Products](#)



Guangdong Modgen Technology Co.,Ltd Is A Wholly Owned Subsidiary Of Guangdong Heng Li Precision Spring Co.,Ltd. GUANG DONG MODGEN TECHNOLOGY CO.,LTD EARL follows German craftsmanship, with dual shaft and dual light source, using osram 3014 high efficiency LED chip in both cool and warm white.

[More info...](#)

[Products](#)

Was established to design and manufacture high-quality LED lighting products. Since its conception. ANOLIS uses only the best components and precision manufacturing techniques, ensuring that the brand offers all the benefits associated with LED lighting: extreme efficiency, long life, low maintenance, low heat and no UV output.



[More info...](#)

[Products](#)



Glamox Limited is a leading supplier of lighting solutions to the professional building market, offering complete product ranges for schools, healthcare facilities, commercial and industrial buildings, retail facilities, hotels and restaurants.

[More info...](#)

[Products](#)

Designing and manufacturing lights for commercial and domestic use with over 30 years experience. Offers quality, choice, innovation and great service. experience in the lighting industry means we can deliver lighting solutions using the latest LED technologies, designed for you by our in-house designers and our innovation specialists on the south coast.



[More info...](#)

[Products](#)



Archxx is a design lighting manufacturer. Develop and distribute design products " made in Germany " since 1994. The modular character offers designers and architects a great variety of applications. Design and economic efficiency are particularly noted for these products.

[More info...](#)

[Products](#)

Founded in 1981. Foscarini is an innovative Italian lighting company that views each lamp as a passion project, fueled by an appreciation for and strong understanding of timeless design.



[More info...](#)

[Products](#)



Naco lighting was founded in year 2000, with vast experience working with the hospitality industry and home decoration. As a technology start-ups enterprise, we have professional mechanical engineer, construction engineer, graphic designer and product designer.

[More info...](#)

[Products](#)

Founded 1585 Vetreria Vistosi's murano glass light fixtures represent a blend of innovative design and the secrets of the traditional craft of glass blowing.



[More info...](#)

[Catalogue](#)



Born from an industry demand for a comprehensive offering of distinctive line and low voltage lighting fixtures for the commercial market with output up to 2,000 lumens. Our products are designed to meet required specifications while echoing the aesthetics of the project.

[More info...](#)

[Products](#)

Incorporated in 1987 by business manager and designer Paul Ameloot, today Delta Light® has developed to become the market leader and trendsetter in architectural lighting. Presenting innovative lighting designs, the company is recognised throughout the world for its subtle blend of ambiance, elegance, functionality, and design, both in interior and exterior lighting.



[More info...](#)

[Products](#)



Feelux is known for developing unique and innovative products for the lighting industry worldwide. Our products can be seen in installations ranging from healthcare and higher learning to the office environment and hospitality to retail.

[More info...](#)

[Products](#)

Delightfull's lighting reflects a personality, a frame of mind and strong emotions are present in each detail. Working with our hands we transfer our passion and devotion into everything we make and thus our masterpieces are born. Share soul and heritage with the world... A delightfull world.



[More info...](#)

[Products](#)



Vibia specializes in the manufacture of lighting designed products in collaboration with well renowned designers and architects. Design oriented lighting that allows professionals to create unique and fully customised architecture & interior design projects.

[More info...](#)

[Products](#)

Founded in 1932, Metalarte is a pioneer in the lighting market which has maintained a commitment to innovation and new creative values for over fifty years. In the sixties and seventies it renewed its catalogue and started working with external designers.



[More info...](#)

[Products](#)



The Lumenpulse Group designs, develops, manufactures and sells a wide range of high performance and sustainable specification-grade LED solutions for commercial, institutional and urban environments.

[More info...](#)

[Products](#)

Lumens Per Watt Lamping Comparison - Light Bulbs at a Glance

Lumens Per Watt Lamping Comparison - Light Bulbs at a Glance
Lumens are a measurement of the perceived power of light. All ratings approximate.

Efficacy = lumens/watts. The higher the number, the more efficient.
Approximate CO2 emission per 1,000 hours of use assuming coal

| Incandescent | | | | | | | |
|--------------|----------------|--------------------------|---------|------------------|--------------|-----------|------------|
| Energy Watts | Output Lu-mens | Efficacy Lumens Per Watt | CO2 lbs | CO2 Lu-men Ratio | Liff (Hours) | CRI 1-100 | CCT Kelvin |
| 25 | 170 | 07 | 33 | .194 | 1000 | 100 | 2700 |
| 40 | 495 | 12 | 46 | .105 | | | |
| 60 | 830 | 14 | 78 | .093 | | | |

Pros: ----- cheap; gives a pleasant warm light.
Cons: ----- least efficient of all the bulbs, hot.
Uses: ----- General lighting

| Halogen | | | | | | | |
|--------------|----------------|--------------------------|---------|------------------|--------------|-----------|-------------|
| Energy Watts | Output Lu-mens | Efficacy Lumens Per Watt | CO2 lbs | CO2 Lu-men Ratio | Liff (Hours) | CRI 1-100 | CCT Kelvin |
| 20 | 320 | 16 | 26 | .081 | 2000 - 4000 | 100 | 2950 - 6000 |
| 35 | 600 | 17 | 46 | .077 | | | |
| 50 | 900 | 18 | 65 | .072 | | | |

Pros: ----- more efficient than incandescent bulbs; bright light, Ex-cel-lent colour rendering
Cons: ----- burns very hot; more expensive than incandescent
Uses: ----- 220v tubes - General lighting, floodlights, 12V - ----- accent lighting, task lighting
Notes: ----- must be careful using these bulbs near flammable ma-terials or in closed places.

| Compact Fluorescent (CFL) | | | | | | | |
|---------------------------|---------------|--------------------------|---------|-----------------|--------------|-----------|-------------|
| Energy Watts | Output Lumens | Efficacy Lumens Per Watt | CO2 lbs | CO2 Lumen Ratio | Liff (Hours) | CRI 1-100 | CCT Kelvin |
| 26 | 1800 | 69 | 34 | .019 | 12000 | 82 - 90 | 2700 - 6500 |
| 32 | 2400 | 75 | 42 | .018 | | | |
| 36 | 2800 | 78 | 47 | .016 | | | |

Pros: ----- Efficient
Cons: ----- Cost of bulb; sometimes they can't physically fit; to replace incandescent bulbs.
Uses: ----- General lighting
Notes: ----- Frequent switching on and off reduces efficiency.

| Ceramic Metal Halide | | | | | | | |
|----------------------|---------------|--------------------------|---------|-----------------|--------------|-----------|-------------|
| Energy Watts | Output Lumens | Efficacy Lumens Per Watt | CO2 lbs | CO2 Lumen Ratio | Liff (Hours) | CRI 1-100 | CCT Kelvin |
| 22 | 1155 | 53 | 27 | .023 | 12000 | 81-96 | 2900 - 4100 |
| 70 | 4500 | 64 | 91 | .020 | | | |
| 150 | 9800 | 65 | 195 | .020 | | | |

Pros: ----- extremely efficient; give a brilliant light; bulbs come in different color temperatures; good color rendering.
Cons: ----- cost of both fixture and bulb; burns hot
Uses: ----- sports arenas, stadiums, auditoriums, and convention halls
Notes: ----- not to be used near flammable materials. Bulbs usually must burn in a certain position.

Comparing Efficiency Is Easy
The lumens and wattage will often be given on the packaging or on the bulb itself. To compare bulbs for efficiency, determine the number of lumens the bulb will produce per watt by dividing the lumens by watts. The lower the result, the more efficient the bulb. For example, an 4-Watt, 400-lumen LED bulb produces about 100 lumens per watt (that is 400 divided by 4). A common 40-Watt, 495-lumen incandescent bulb produces only 12 lumens per watt

generated electricity.
Co2 output per lumen is a finer gauge of sustainability.
CRI = Color Rendering Index. 100 = full color range: incandescent.
CCT = Correlated Color Temperature in degrees Kelvin.

| Fluorescent Tube T5 T8 | | | | | | | |
|------------------------|----------------|--------------------------|---------|-----------------|---------------|-----------|--------------|
| Energy Watts | Output Lu-mens | Efficacy Lumens Per Watt | CO2 lbs | CO2 Lumen Ratio | Liff (Hours) | CRI 1-100 | CCT Kelvin |
| T5 (28W) | 2900 | 104 | 31 | 0.015 | 25000 + 35000 | 82 - 85 | 3000 - 6500 |
| T5 (35W) | 3450 | 99 | 70 | .014 | | | |
| T8 (17W) | 1260 | 80 | 22 | .017 | 20000 - 46000 | 78 - 96 | 3000 - 65000 |
| T8 (32W) | 2800 | 80 | 46 | .016 | | | |

Pros: ----- bulb burns cooler; very efficient; can come in various CRI ratings; comes in different
Cons: ----- not dimmable; fixtures are more costly; known to flicker at times.
Uses: ----- General
Notes: ----- frequent switching on and off reduces efficiency.

| Compact Fluorescent (CFL) | | | | | | | |
|---------------------------|---------------|--------------------------|---------|-----------------|--------------|-----------|-------------|
| Energy Watts | Output Lumens | Efficacy Lumens Per Watt | CO2 lbs | CO2 Lumen Ratio | Liff (Hours) | CRI 1-100 | CCT Kelvin |
| 13 | 850 | 65 | 17 | .020 | 10000 | 82 - 90 | 2700 - 4100 |
| 18 | 1100 | 61 | 23 | .020 | | | |
| 23 | 1600 | 69 | 30 | .018 | | | |

| High Pressure Sodium (HPS) | | | | | | | |
|----------------------------|----------------|--------------------------|---------|------------------|--------------|-----------|------------|
| Energy Watts | Output Lu-mens | Efficacy Lumens Per Watt | CO2 lbs | CO2 Lu-men Ratio | Liff (Hours) | CRI 1-100 | CCT Kelvin |
| 35 | 2250 | 64 | 46 | .020 | 16000 | 22 | 1900 |
| 70 | 6400 | 91 | 91 | .014 | | | |

Pros: ----- extremely efficient, long lasting.
Cons: ----- bad color rendering, produces yellowish light; slowly lose their brightness with time
Uses: ----- very popular for indoor horticulture, outdoor and industrial applications

| Light Emitting Diodes (LEDs) | | | | | | | |
|------------------------------|---------------|--------------------------|---------|-----------------|--------------|-----------|-------------|
| Energy Watts | Output Lumens | Efficacy Lumens Per Watt | CO2 lbs | CO2 Lumen Ratio | Liff (Hours) | CRI 1-100 | CCT Kel-vin |
| 4 | 400 | 100 | 04 | .015 | 50000 | 50 - 95 | 2700 - 6500 |
| 7 | 700 | 100 | 07 | .014 | | | |
| 9 | 900 | 100 | 09 | .013 | | | |

Pros: ----- High durability - no filament or tube to break; long life span; low power consumption; low heat generation
Cons: ----- High cost of bulb (in the meantime 1-1.5USD/W)
Uses: ----- wide variety of uses including general lighting, accent lighting, and decorative lighting
Notes: ----- LED technology is relatively new, and is changing every day. The quality and efficiency of the bulbs are improving all the time.

Measuring Units Light Level - Illuminance
Common Light Levels Outdoor

Illumenance is measured in foot candles (ftcd, fc, fcd) (or lux in the metric SI system). A foot candle is actually one lumen of light density per square foot, one lux is one lumen per square meter.

1 lux = 1 lumen / sq meter = 0.0001 phot = 0.0929 foot candle (ftcd, fcd)

1 phot = 1 lumen / sq centimeter = 10000 lumens / sq meter = 10000 lux

1 foot candle (ftcd, fcd) = 1 lumen / sq ft = 10.752 lux

Common light levels outdoor at day and night can be found in the table below:

| Condition | Illumination | |
|----------------|--------------|---------|
| | (ftcd) | (lux) |
| Sunlight | 10,000 | 107,527 |
| Full Daylight | 1,000 | 10,752 |
| Overcast Day | 100 | 1,075 |
| Very Dark Day | 10 | 107 |
| Twilight | 1 | 10.8 |
| Deep Twilight | .1 | 1.08 |
| Full Moon | .01 | .108 |
| Quarter Moon | .001 | .0108 |
| Starlight | .0001 | .0011 |
| Overcast Night | .00001 | .0001 |

Measuring Units Light Level - Illuminance
Common and Recommended Light Levels Indoor

The outdoor light level is approximately 10,000 lux on a clear day. In the building, in the area closest to windows, the light level may be reduced to approximately 1,000 lux. In the middle area its may be as low as 25 - 50 lux. Additional lighting equipment is often necessary to compensate the low levels. Earlier it was common with light levels in the range 100 - 300 lux for normal activities. Today the light level is more common in the range 500 - 1000 lux - depending on activity. For precision and detailed works, the light level may even approach 1500 - 2000 lux.

Calculating Illumination
Illumination can be calculated as
I = Ll Cu LLF / Al (1)
where
I = illumination (lux, lumen/m2)
Ll = lumens per lamp (lumen)
Cu = coefficient of utilation
LLF = light loss factor
Al = area per lamp (m2)

Example - Illumination
10 incandescent lamps of 500 W (10600 lumens per lamp) are used in an area of 50 m2. With Cu = 0.6 and LLF = 0.8 illumination can be calculated as
I = 10 (10600 lumens) (0.6) (0.8) / (50 m2) = 1018 lux

The table below is a guidance for recommended light level in different work spaces:

| Activity | Illumination (lux, lumen/m²) |
|---|------------------------------|
| Public areas with dark surroundings | 20 - 50 |
| Simple orientation for short visits | 50 - 100 |
| Working areas where visual tasks are only occasionally performed | 100 - 150 |
| Warehouses, Homes, Theaters, Archives | 150 |
| Easy Office Work, Classes | 250 |
| Normal Office Work, PC Work, Study Library, Groceries, Show Rooms, Laboratories | 500 |
| Supermarkets, Mechanical Workshops, Office Land-scapes | 750 |
| Normal Drawing Work, Detailed Mechanical Work-shops, Operation Theatres | 1,000 |
| Detailed Drawing Work, Very Detailed Mechanical Works | 1500 - 2000 |
| Performance of visual tasks of low contrast and very small size for prolonged periods of time | 2000 - 5000 |
| Performance of very prolonged and exacting visual tasks | 5000 - 10000 |
| Performance of very special visual tasks of extremely low contrast and small size | 10000 - 20000 |



KINGDOM OF BAHRAIN

ELAMES LIGHTING BSC
P.O. Box 26095,
Manama, Kingdom of Bahrain
T : +973 1770 3336,
F : +973 1770 0574
E : sales@behzad-group.com



KINGDOM OF SAUDI ARABIA

BEHZAD TRADING
P.O. Box 76226,
Al Khobar-Dammam, Highway, KSA
T : +966 3 858 1605, +966 3 858 1607
F : +966 3 858 1610
E : salsaleh@behzad-group.com



UNITED ARAB EMIRATES

CHATEAU BUILDING MATERIALS
P.O. Box 94684
United Arab Emirates
T : +971 2 642 3226
F : +971 2 641 6603
E : chateau@behzad-group.com