LED grow lights for horticulture

TECHNOLOGY AND PRODUCTS

c-led

Better light for better growth

EVERY PLANT SPECIES HAS SPECIFIC NEEDS: WE UNDERSTAND THEM AND PROVIDE YOU WITH THE RIGHT SOLUTION.

WE STUDY AND PRODUCE LAMPS AND LED MODULES FOR HORTICULTURE: TECHNOLOGICALLY ADVANCED, THEY ARE DESIGNED TO HELP GROWERS INCREASE HARVEST VOLUMES, CREATE VALUE BY IMPROVING THE NUTRACEUTICAL PROPERTIES OF THE PLANT, EXTEND THE SUMMER CROP GROWING SEASON AND ENSURE PRODUCTION EVEN IN WINTER.

What sort of plants do you want to grow?

THE RIGHT LIGHT WHATEVER THE GROWING SET-UP

We started building our lighting know-how over twenty years ago, when we began developing electronic applications with a specific focus on the LED technology that has, for many years now, been changing the way light is designed, opening up new horizons also in the area of cultivation.

INTENSIVE CROPS

Production of Solanaceae (tomato, aubergine) and Cucurbitaceae (cucumber, melon) uninterrupted and guaranteed for 365 days a year, using customised light spectra according to crops. Produce shelf life is increased and greater plant compactness reduces manpower requirements.

GROWING
- GREENHOUSE
- VERTICAL FARM

SPECTRA
- Hortis spectrum
- Fruits spectrum (intracanopy)
- Extended White spectrum “Come il Sole” ("Like the sun")

LAMPS
- Interlight lamp
- Toplight Plus lamp

SMALL FRUITS

Raspberries, strawberries, blackberries and blueberries are typically summer crops that require special care and lots of light. Thanks to LED lamps fruit growth can be regulated to obtain higher yields as well as firmer fruits, with brighter colouring which consequently are better sellers.

GROWING
- GREENHOUSE
- VERTICAL FARM

SPECTRA
- Fruits spectrum

LAMPS
- Interlight lamp
- Toplight Plus lamp
- Circular lamp

ALGAE

Growing algae suitable for human consumption such as spirulina and chlorella, marketed as fresh or freeze-dried products, is a business not linked to a specific production season and highly appreciated by the food supplement industry. LED lamps speed up algal growth ensuring earlier harvests and at the same time, products rich in antioxidants.

GROWING
- GREENHOUSE
- VERTICAL FARM

SPECTRA
- Purple EVO spectrum
- Custom spectra

LAMPS
- Penta-Circular lamp
- Toplight Plus lamp

MUSHROOMS

Mushrooms include several very popular varieties, such as pleurotus or champignon (button mushrooms). With C-LED, it is possible to achieve improved product characteristics, such as better size and a shorter waiting time between one harvest and the next.

GROWING
- GREENHOUSE
- VERTICAL FARM

SPECTRA
- Mushroom spectrum

LAMPS
- Slim lamp
- Circular lamp

ORNAMENTAL PLANTS

Roses, gerberas, chrysanthemums, tulips, peonies and daffodils are just some of the floricultural products that can be very successfully grown thanks to the C-LED technology: longer stems with larger diameter, earlier, more homogeneous flowering, and more compact inflorescence.

GROWING
- GREENHOUSE
- VERTICAL FARM

SPECTRA
- Bloom spectrum

LAMPS
- Toplight Plus lamp
- Circular lamp

LEAFY VEGETABLES

Leafy vegetables include lettuce, chicory, thyme, parsley, basil and other crops that are harvested at the time of maximum leaf growth. C-LED lamps ensure shorter production cycles, guaranteeing thriving production throughout the year and making it easier to control flowering.

GROWING
- GREENHOUSE
- VERTICAL FARM

SPECTRA
- Hortis spectrum
- Natural Indoor spectrum

LAMPS
- Toplight Plus lamp
- Circular lamp

BABY LEAF

Baby leaf crops include plants of lettuce, rocket, spinach, corn salad, cabbage and many others normally sold once they have grown 3-5 true leaves, about 20-40 days after sowing. Early harvesting, to ensure a higher number of cycles per year, is one of the primary goals that the C-LED research activity aims at.

GROWING
- GREENHOUSE
- VERTICAL FARM

SPECTRA
- Natural Indoor spectrum

LAMPS
- Slim lamp
- Circular lamp

MICROGREEN

Microgreens can be defined "baby" vegetable varieties as they are harvested as soon as they grow the first two true leaves, i.e. after about 7-20 days. The peculiarity of these crops is the very high levels of vitamins and antioxidants contained in their tissues, which, with C-LED lamps, can be up to 40 times higher than in traditional vegetables.

GROWING
- GREENHOUSE
- VERTICAL FARM
- GROW UNIT

SPECTRA
- Natural spectrum

LAMPS
- Slim lamp
- Circular lamp

HEMP

Production of Hemp inflorescences for active principle extraction. C-LED offers solutions to ensure earlier production and shortening of plant internodes: this increases the amount of flowers and dry matter of the harvested product resulting in lower drying costs and higher production yields.

GROWING
- GREENHOUSE
- VERTICAL FARM

SPECTRA
- Purple spectrum
- Hortis spectrum
- Extended White spectrum

LAMPS
- Slim lamp
- Circular lamp
- Interlight lamp
- Toplight Plus lamp

MICROPROPAGATION

All the phases preceding field planting of micropropagated fruit plants are carried out in a completely sterile environment: cell multiplication, distension, rooting and finally, acclimatising, in order to obtain, with C-LED lamps, certified and virus-free material.

GROWING
- VERTICAL FARM

SPECTRA
- Micro-propagation spectrum

LAMPS
- Slim lamp

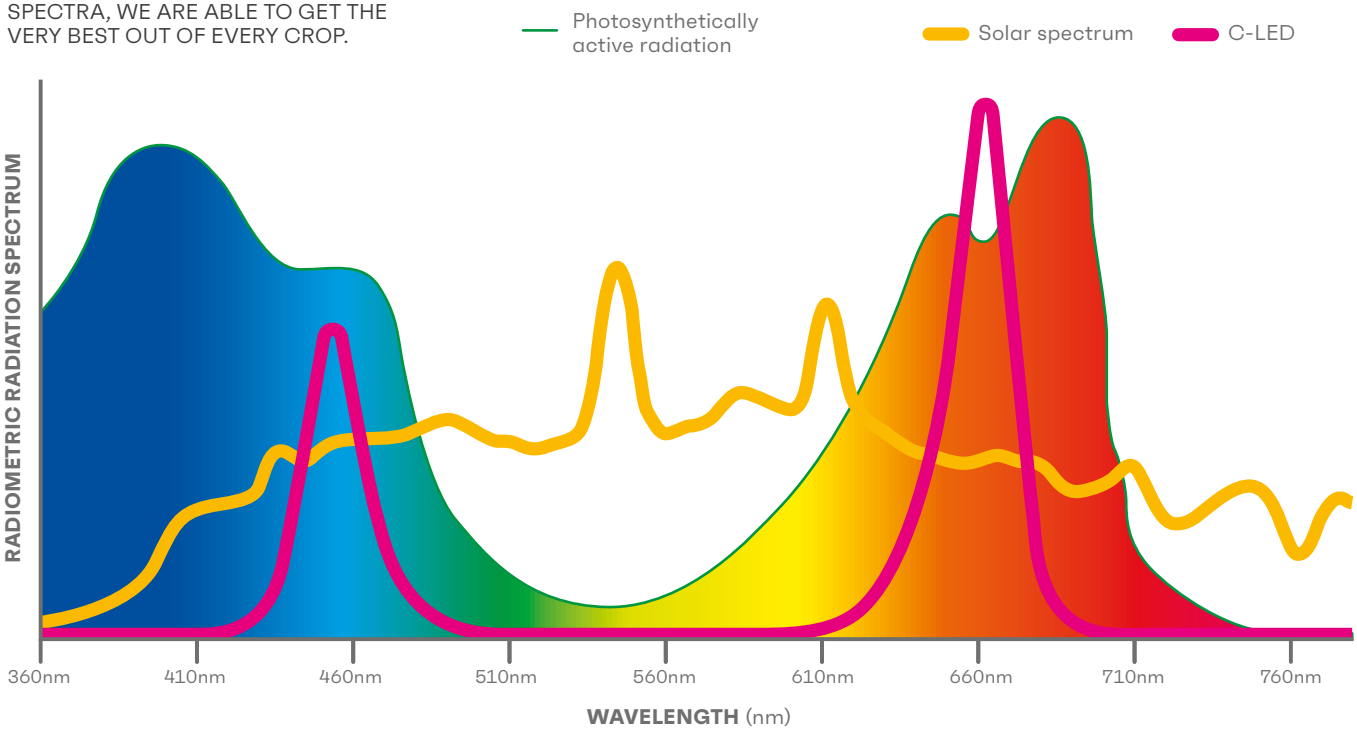
EXPERTISE THAT GROWS AND GROWS.

EACH PLANT HAS SPECIFIC LIGHT INTENSITY/TYPE REQUIREMENTS. HOW CAN WE GET THE BEST PERFORMANCE FROM OUR PLANTS?

C-LED studies the correct recipe for each type of plant, at every stage of its growth. C-LED can count on a highly experienced research team: the company provides scientists and researchers at universities and research facilities with constant close support and they, in turn, support C-LED in developing cutting-edge products. Together with you, we can study and choose the right light recipe to optimize yield, also in line with your objectives. The best recipe combines several factors: light spectrum, intensity, schedules, uniformity and positioning.

DIFFERENT COMBINATIONS OF LIGHT LET YOU CONTROL HIGHLY SPECIFIC PLANT CHARACTERISTICS, FROM COMPACTNESS TO COLOUR INTENSITY AND FOLIAGE DEVELOPMENT, THUS BOOSTING RESULTS.

WE INVEST CONTINUOUSLY TO ENSURE THAT OUR LIGHTING PROPOSALS ARE ALWAYS STATE-OF-THE-ART. THROUGH CAREFUL DIFFERENTIATION OF LIGHTING SPECTRA, WE ARE ABLE TO GET THE VERY BEST OUT OF EVERY CROP.



LIGHT THAT PLANTS LIKE

Chlorophylls (the molecules that make up plants) don't capture all wavelengths in the same way. Instead, they have a liking for some spectra rather than others. It is intuitively understandable that leaves reflect green light with ease; that is why they appear green, as they absorb only minimal amounts of this light. Blue and red spectra, instead, are vital to plants. Indeed, it is not by chance that the absorption peaks in chlorophyll types that play the main role in photosynthesis - chlorophyll a and chlorophyll b - are found across the blue and red wavelengths.

THE SPECTRA STUDIED BY C-LED

THE RESEARCH ACTIVITY AT C-LED AND ITS RESEARCH CENTRE PARTNERS HAS LED TO IDENTIFYING THE OPTIMAL SPECTRA FOR EACH CROP

SUNLIGHT

The Sunlight spectrum is used in Toplight and Interlight lamp applications for greenhouse production mainly of **Cucurbitaceae** e.g. **melon**, **watermelon** or **cucumber.**

BLOOM

The Bloom spectrum is indicated to mainly induce **flowering** and is therefore chiefly used for **ornamental crops.**

FRUITS

The Fruits spectrum is particularly suitable for **small fruits** such as **strawberries**, **blueberries** and **raspberries** in greenhouse production set-ups.

NATURAL

The Natural spectrum, specific for **delicate plants** often found in nurseries. Grafted seedlings or seedlings that must become acclimatised to the open field can benefit from this light; excellent spectrum for **microgreen growing.**

HORTIS

The Hortis spectrum is the main spectrum for many **horticultural crops** to be grown in greenhouses, mainly **edible** or **herb type** leafy crops, but also products suitable for indoor growing. It is used as Toplight for intensive **tomato growing.**

PURPLE EVO

The Purple EVO spectrum is the spectrum commonly used for the production of **algae** in tanks or in photobioreactors.

PURPLE

The Purple spectrum is the most indicated spectrum for the production of **medicinal hemp.**

NATURAL INDOOR

The Natural Indoor spectrum is particularly suitable for the production of **leaf** and **herb varieties,** in production environments where the influence of outdoor lighting is reduced, such as in plant factories, in vertical farming o in containers.

MICRO PROPAGATION

Highly recommended to support the growth of **micropropagated plants**, this light is also suitable for **small fruits** in indoor environments such as in plant factories and vertical farming.

EXTENDED WHITE

"Like the sun".
From HPS (High Pressure Sodium) to HPL (High Performance LED).

MUSHROOMS

Specific spectrum for mushroom growing.

EFFECTIVE LIGHT POSITIONING.

ADVANTAGES OF USING LED LAMPS

- **SHORTENED GROWTH CYCLES**
- **INCREASED PRODUCTION**
- **IMPROVED PRODUCE SHELF LIFE AND TASTE**
- **COLOUR AND SHAPE OPTIMISATION**

Sustainability and innovation are key concepts in C-LED's strategy. We work to ensure that our products are applied in synergy with the environment and protect it. Our state-of-the-art lamps are designed to help growers **increase yield, reduce costs and extend the growing season** of summer crops, guaranteeing production even in the winter period. Thanks to our lamps, the production yield can be increased **while improving the crops nutraceutical* properties** (excellent nutritional quality, rich in vitamins and antioxidants).

Whatever the sector, maximising the functional and aesthetic yield of the plants to optimise production is essential. C-LED solutions provide the right light needed to grow plants in any season, even in winter, driving specific agronomic responses such as flowering, maturation, leaf pigmentation and fruit ripening.

C-LED PROVIDES TOPLIGHT AND INTERLIGHT LAMPS FOR GREENHOUSE GROWING AND LIGHTING SYSTEMS FOR INDOOR GROWING (PLANT FACTORY, VERTICAL FARMING, MICROGREENS, MICROPROPAGATION).

BASED ON PROVEN SCIENTIFIC RESEARCH, WE HAVE IDENTIFIED THE CORRECT INCLINATION FOR LIGHT:

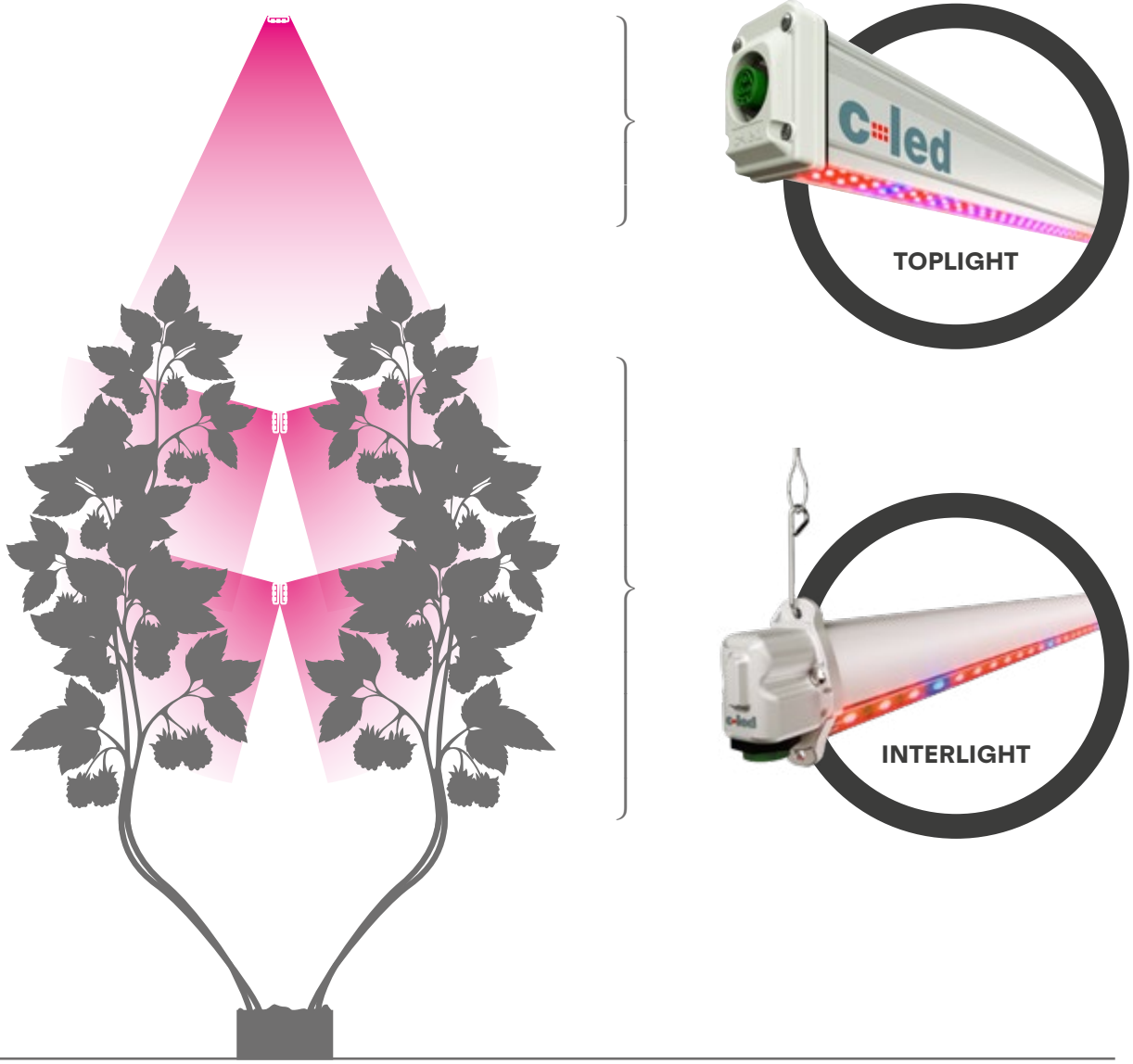
C-LED LAMPS MAXIMISE THE AMOUNT OF LIGHT THAT REACHES PLANTS.

*Foodstuffs with high levels of substances beneficial to our health.

LIGHT INTENSITY AND ANGLE

Once the correct spectrum has been identified, the quantity of photons the plant needs to be supplied with becomes a vital parameter for ensuring proper growth patterns: it must not be too high as this could cause stress and reduce productivity but not too low because this would mean there is still margin for improvement.
We study the amount of light needed by the plant according to its growth rate, morphology and age.
We supply just the right amount of light using the most appropriate C-LED lamps on the basis of the maximum light flow intensity they emit, positioning them at a distance that avoids dispersion (never too far away), and ensuring that the leaves intercept the light at an angle as close as possible to 90°.

GREENHOUSE LIGHTING POSITIONING



INDOOR LIGHTING POSITIONING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Toplight Plus

THE LIGHT FROM ABOVE

CUSTOMISATION OF LIGHT QUALITY TO MEET PRODUCTION NEEDS.

PLUG AND PLAY: EASY INSTALLATION AND ADAPTABILITY TO ANY KIND OF GREENHOUSE.

SLIM DESIGN STUDIED TO FACILITATE THE PASSAGE OF SUNLIGHT.

LOWER ENERGY CONSUMPTION COMPARED TO CONVENTIONAL TOP-LIGHTING LAMPS.

LONG-LASTING LAMPS AND LOW MAINTENANCE COSTS.

C-LED'S TOPLIGHT PLUS LAMPS OFFER UNIQUE BENEFITS, REPLACING CONVENTIONAL GREENHOUSE LIGHTING TECHNOLOGIES (HPS) WITH SYSTEMS THAT ARE HIGHLY EFFECTIVE FROM BOTH AN AGRONOMIC AND AN ENERGY VIEWPOINT.

The types of light we propose, in conjunction with advanced technologies, ensure that our product is appreciated by those seeking cutting-edge solutions. **Our top-lighting lamps produce less heat than conventional HPS ones** (with differences of up to 30°C), allowing for in-greenhouse climate control according to the specific crops being grown: **this lets growers position the lamps closer to the plants**, thereby maximizing their absorption of light energy.

Several TopLight Plus series types have been produced. They all have similar lamp bodies but differ from each other in terms of emitted light spectra in order to meet different growing requirements.

Long-lasting lamps (average lifespan in excess of 50,000 hours) and low maintenance requirements, together with outstanding production results, allow us to offer a product which, from the farmer's viewpoint, will pay for itself sooner.

COMPLETE TECHNICAL INFORMATION ON PAGE 20


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Interlight

THE LIGHT INBETWEEN

LIGHT HOMOGENEITY.

C-LED lamps are made to distribute light uniformly over the illuminated surface in order to avoid plants growing in a non-homogeneous way (agronomic inhomogeneity: number of flowers, fruits, vertical growth, number of leaves, etc.)

LIGHT CUSTOMISATION.

We customise the quantity and quality of light in relation to the plants and their needs. Quality: the right ratio of emitted colours (blue, green, red, far-red). Quantity: intensity of light that reaches the plants (PPFD: Photosynthetic Photon Flux Density)

LIGHT DESIGN.

C-LED lamps are of an extremely compact size in order to prevent large shady areas, thus favouring correct plant illumination.

LIGHT DIRECTION.

The luminous flux emitted by C-LED lamps is designed to ensure that the maximum amount of irradiating light hits the leaves.

PLUG AND PLAY LIGHT.

The lamps can easily be installed in series, providing significant installation time and cost savings.

OUR INTERLIGHT LAMPS OFFER THE BEST TECHNOLOGY FOR GREENHOUSE LIGHTING OF TOMATOES AND VERTICAL GROWING PLANTS IN GENERAL.

Thanks to our studies, we have demonstrated how light coming from the top (artificial or solar) is only effectively absorbed by the top part of the plant. In fact, the useful amount of light progressively decreases below the top of the plant.

OUR INTERLIGHT LAMPS MAKE UP FOR THIS LIGHTING SHORTAGE THROUGH A MORE HOMOGENEOUS DISTRIBUTION THAT IS BASED ON THE PLANTS' ACTUAL PHYSIOLOGICAL NEEDS.

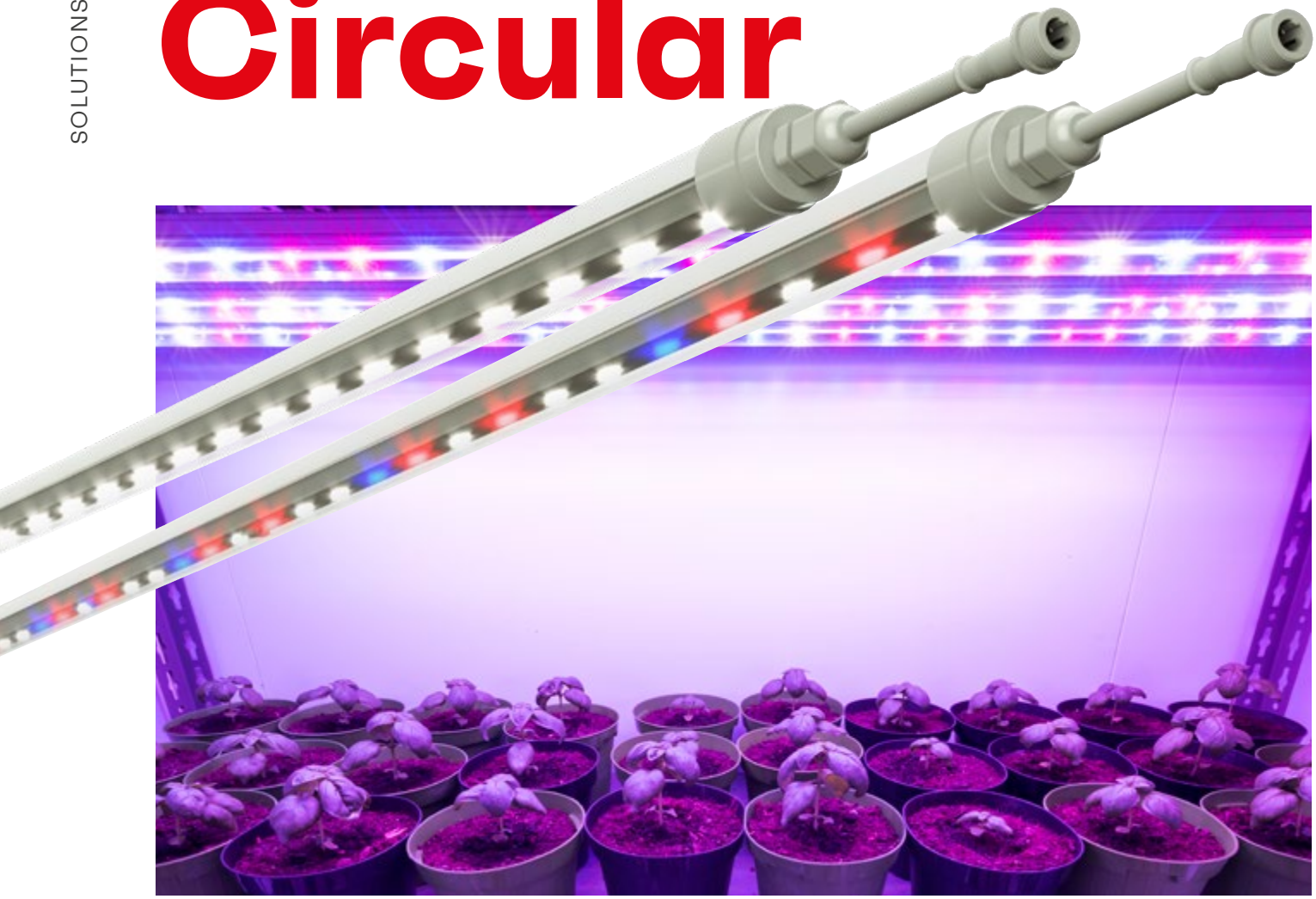
THE MAIN BENEFITS OFFERED BY C-LED'S INTER-LIGHTING LAMPS ARE:

- Increased production yield
- Greater resistance to diseases, resulting in healthier plants
- Less malformation of leaves and fruit*;
- Increase in flowering, amount of fruit and crop harvest (e.g. tomato);

** the proper amount of blue light reduces leaf and structural malformations in plants.*

COMPLETE TECHNICAL INFORMATION ON PAGE 20

Circular

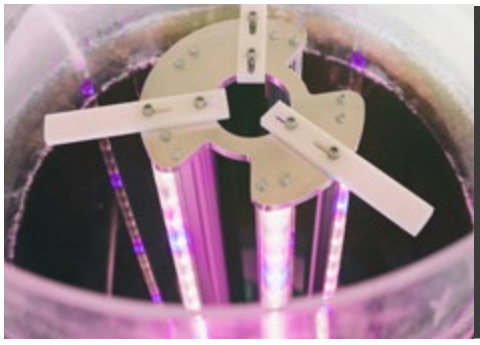


THE NEW CIRCULAR LAMP DEVELOPED BY C-LED IS COMPOSED OF A SINGLE TRANSPARENT POLYCARBONATE TUBE DESIGNED PRIMARILY TO PROMOTE THE GROWTH OF SMALL FRUITS, LEAFY SPECIES OR FLOWERING HEMP PLANTS.

Thanks to its lightweight design and ease of installation in series, with practical connectors on each end, the Slim lamp can be installed close to the plants for improved photosynthetic efficiency and in the confined spaces typical of intensive vertical farm production facilities.

In recent years, important technological innovations in LED lamps have been introduced on the market, in particular the possibility of emitting the precise amount of light and the specific light spectrum (light colour) to stimulate the development of the plants.

COMPLETE TECHNICAL INFORMATION ON PAGE 21



Penta-Circular

We study the effect of LED light on the growth and development of algae within enclosed and sheltered systems, such as photobioreactors. We have developed this specific lamp, already tested and used at a number of research centres.

Slim

THE USE OF LED LAMPS IN THE MICROGREENS AND MICROPROPAGATION SECTOR IS AN INNOVATION THAT OFFERS NUMEROUS ADVANTAGES OVER CONVENTIONAL NEON LAMPS.

Tests conducted by C-LED in collaboration with university research institutes have enabled us to develop a lamp specifically for micropropagation, to offer a high-performance solution for a wide variety of plants. The greater energy savings obtained with Slim lamps allow for efficiency enhancement as well as shorter switch-on and switch-off times. The size and the weight of the lamps, reduced to a minimum, together with their lower heat emission, allows us to keep the Slim lamps at a closer distance in plant factories or other similar seedling growing systems, improving their photosynthetic efficiency and reducing consumption.

COMPLETE TECHNICAL INFORMATION ON PAGE 21

THE SPECTRUM OF LIGHT EMITTED BY THE C-LED LAMPS HAS BEEN SPECIALLY DESIGNED TO ENSURE HARMONIOUS DEVELOPMENT AND BETTER OVERALL HEALTH OF THE PLANT.

All these aspects facilitate the optimisation of environment management and production yields.

Cooperating and sharing skills.

SOME INDUSTRIAL PARTNERSHIPS

Photobioreactor with Penta-Circular Light lamp - C-LED and F&M Partnership

WE FIRMLY BELIEVE THAT BY SHARING DIFFERENT SKILLS AND KNOWLEDGE, WE CAN DEVELOP MORE INNOVATIVE AND EFFICIENT PROJECTS.

MUTUAL EXCHANGES OF EXPERIENCE AND NETWORKING FORM THE BASIS OF OUR GROWTH STRATEGY.

TOMATO

Fri-El is a company from the energy sector, which in recent years has expanded its skills to the plant growing field, in particular table tomatoes in high-tech greenhouse growing set-ups. Fri-El, with its Fresh Guru brand, has relied on C-LED technology for a few years now to produce tomatoes all year, including in winter, in order to improve production yields and the quality of its products. The combination of a double row of Interlights, a top and a bottom one, maintains lighting coverage throughout the architecture of the lamp. The SUNLIGHT spectrum helps to enhance flowering and ensure a balanced, consistent growth of tomato plants all year round.

MICROPROPAGATION

Micropropagation is the core business of Vitroplant, a farming company specialising in the multiplication of high-value plants such as small fruit shrubs or fruit trees, and in open field acclimatizing. Lighting management, the most critical and important process factor, is achieved with our technology. We have designed Slim lamps, suitable for confined spaces without natural lighting, and the PROPAGATION spectrum, specifically created to positively influence plants. The acclimatisation phase is carried out in nurseries and to support the growth of already grown plants, Circular lamps have been installed, with the special NATURAL spectrum, particularly suitable for plants that have undergone stress, such as those that must adapt to open field conditions or have just been grafted.

PHYTOTRONS

Agroservice Spa is a company based in the Marche region, in Italy, specialising in seed multiplication and research activities in the field of new cultivar breeding for herbaceous, forage and leguminous crops. In conjunction with C-LED, Agroservice has decided to invest in a new research project, in which the growth of hybrid wheat seedlings (the basic genetic material) occurs in a phytotron and lighting is guaranteed by our C-LED technology. To help growers obtain seedlings with a stronger stem, a more intense shade of green and a higher number of spikes, we have installed Toplight Plus units and designed a completely new light spectrum specifically for wheat in a wholly innovative set-up.

Installation of Interlight lamps at Anubias

HEMP

Anubias, located in Villanova di Castenaso (Bologna, Italy), grows a Cannabis variety with low THC content using a hydroponic, soiless growing technique. Thanks to the C-LED lamp technology, in terms of light distribution, intensity and spectrum, the quantity and quality of the harvest are enhanced.

NUTRIENTS

Biolchim Spa is a company based in the Bologna area and specialising in the production and marketing of high-tech fertilizers, and in particular biostimulants, designed to maximise crop productivity. Biolchim is particularly interested in LED lamps for horticulture, so much so that it recently installed a phytotron for specific trials on the nutrient requirements of plants under LED lighting, with a view to rewriting the fertigation formula. For trial purposes, Circular lamps have been installed, particularly suitable for indoor environments.

ALGAE

The "Photosynthetic & Microbiological" University of Florence spin-off initiative, founded by Professor Mario Tredici in 2004, which specialises in research, consultancy and sales of technological solutions for the cultivation of photosynthetic microorganisms (microalgae and cyanobacteria) for industrial applications, has chosen C-LED as its partner for the study of the effects of LED lights on algae, in order to evaluate the effects of LED light on the physiology and biochemistry of photosynthetic microorganisms.

FLOWERS

Nozza Luciano is a farm in the province of Bergamo that has been producing and marketing flowers since 1984. In order to improve production, mainly in autumn and spring, Nozza involved C-LED in a new trial, along with the University of Bologna, on the use of LED lights for different ornamental varieties, with excellent results in terms of flowering time, compactness, flower colour and plant habit.

Supporting each other and growing together

OUR RESEARCH PARTNERSHIPS

PEOPLE HAVE ALWAYS GIVEN C-LED ITS COMPETITIVE ADVANTAGE.

THE RELATIONSHIP WITH UNIVERSITIES WAS STARTED TO TRIGGER AND DEVELOP THE VIRTUOUS CIRCLE THAT RESULTS IN MOTIVATED PEOPLE AND INNOVATIVE AND SUSTAINABLE PROJECTS.

RESEARCH ON ORNAMENTAL AND HORTICULTURAL PLANTS

- Studies and tests on the effects of Inter-Light lamps on vertical-growing plants such as tomatoes and raspberries.
- Tests on strawberry plants in plant factories and in greenhouse gutter systems.
- Imola headquarters, ornamental plants: studies on effects of light spectra compared to natural light on ornamental plants illuminated with Toplighting Plus.

RESEARCH ON MICROPROPAGATION

Founded in 1923, CNR is Italy's largest public research organisation. In the agro-environmental science field, its studies mainly focus on the conservation of genetic resources, sustainable agriculture and traceability of production.

The performed tests concern micro-propagation, that is, the growth of arboreal plant shoots (mainly peach) inside special containers with a substrate containing glucose and other elements to obtain virus-free plants with optimal production standards.

MICRO-ALGAE RESEARCH

The University of Florence studies a wide range of topics spanning from arboreal sciences to genetics and land management.

C-LED experimentation largely focus on the cultivation of spirulina and chlorella in water-filled photobioreactors: light for photosynthesis is provided by special waterproof C-LED lamps with a 360° light flow.

BASIC PHYSIOLOGICAL RESEARCH

Studies on the nutraceutical aspects of leafy plant varieties under differentiated LED light spectra. In addition to the quantity of light administered to the plants, the light spectrum plays an essential role in determining the build-up of antioxidant substances and vitamins.

- Controlled-environment experimentation on the correlation of exposure to UV-A and UV-B radiation with the synthesis of antioxidant molecules inside leaf tissues (in completely safe working conditions);
- Study on the nutraceutical properties of leafy products following exposure to spectra with different ratios of red light and blue light.

RESEARCH ON TOMATO AND MICROGREENS

Several experimental projects focusing on testing the best production set-ups attainable with C-LED lamps in tomato and microgreen growing.

INTERLIGHT LAMP

UP TO **3 µmole/J**

ELECTRICAL CHARACTERISTICS	
Power supply	400Vac / 230Vac
Power absorbed	150W
Lighting technology characteristics	
PPF	PPF = up to 400 µmole/sec
MECHANICAL CHARACTERISTICS	
Protection degree	IP66
Dimensions (L x W x H)	2495 x 110 x 57 mm (Body 68x50) mm”
Average LED lamp lifetime	L70 > 50,000 hours
Operating room temperature	-10°C / +40°C

TOPLIGHT PLUS LAMP

STANDARD OUTPUT/HIGH OUTPUT

UP TO **3 µmole/J**

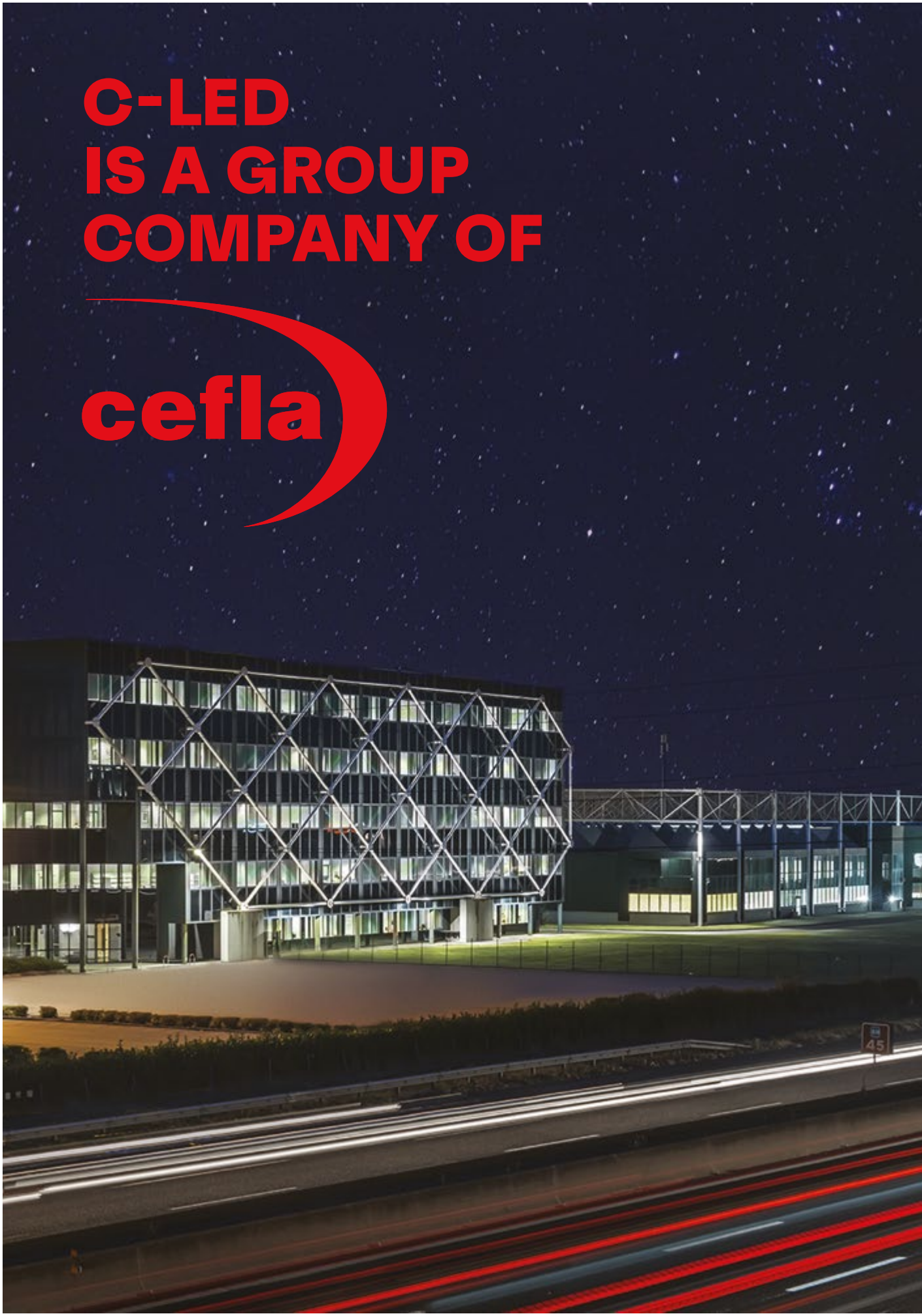
ELECTRICAL CHARACTERISTICS		
Power supply	220-240V~ / f=50-60Hz	220-240V~ / f=50-60Hz
Power absorbed	100W	150W
Lighting technology characteristics		
PPF	PPF = up to 300 µmole/sec	PPF = up to 450 µmole/sec
MECHANICAL CHARACTERISTICS		
Mechanical dimensions	1260 * 108 * 66 mm	1260 * 108 * 66 mm
Protection degree	IP66	IP66
Average lamp lifetime	L70 > 50,000 hours	L70 > 50,000 hours
Operating room temperature	-10°C / +40°C	-10°C / +40°C

CIRCULAR LAMP

ELECTRICAL CHARACTERISTICS	
Power supply	230-240 V - 50 / 60 Hz
Absorbed power	22W
Lighting technology characteristics	
PPF	PPF = up to 53 µmole/sec
MECHANICAL CHARACTERISTICS	
Protection class	IP67
Dimensions (L x W x H)	1290 x 28 x 28 mm
Average LED lamp lifetime	L70 > 50,000 hours
Work environment temperature	-10°C / +35°C

SLIM LAMP

ELECTRICAL CHARACTERISTICS	
Power supply	24 V DC
Absorbed power	Up to 17W/m
Lighting technology characteristics	
PPF	PPF = up to 35 µmole/sec/m
MECHANICAL CHARACTERISTICS	
Protection class	IP65
Dimensions (L x W x H)	from 380 to 1630 x 12 x 16.3 mm
Average LED lamp lifetime	L70 > 50,000 hours
Work environment temperature	-10°C / +35°C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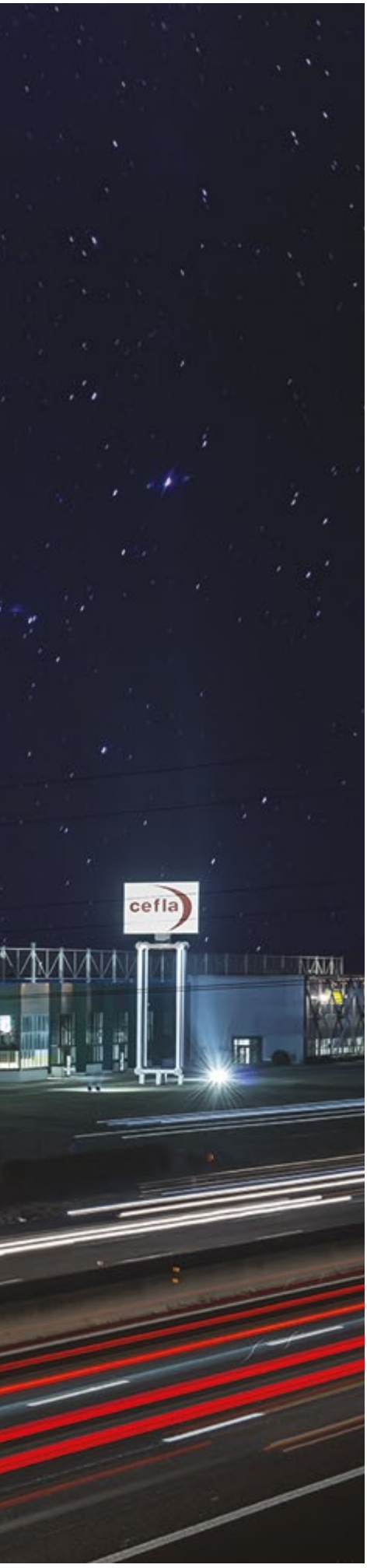


CEFLA IS A SOLID ORGANISATION OPERATING INTERNATIONALLY IN VARIOUS FIELDS OF BUSINESS, WITH CORE VALUES INCLUDING SHARING, INVOLVEMENT AND ENCOURAGING ENTREPRENEURSHIP AS A JOINT PERSONAL EFFORT.

OUR SITES

Cefla was founded in Imola, where we still maintain our headquarters. We also have **26 LOCATIONS** around the world.

PLANTS

We have **14 PRODUCTION SITES** in Itay, China, Germany, Russia and the USA, with a total surface area of 176,000 sqm.

EMPLOYEES

Currently, we can rely on the professionalism and passion of **2000 EMPLOYEES**.

ACTIVE CUSTOMERS

We have **55,000 ACTIVE CUSTOMERS**, who believe and invest in innovation as much as we do.

CEFLA'S BUSINESS UNITS COMBINE SKILLS AND ABILITIES IN ORDER TO ATTAIN IMPORTANT GOALS IN THEIR SPECIFIC FIELDS OF BUSINESS, BUT SHARING A COMMON PROJECT WHERE NETWORKS OF RELATIONS AND TALENT BLEND AND SUPPORT EACH OTHER.

ENGINEERING

Civil and technological plants, cogeneration, trigeneration and systems for power generation and recovery.

SHOPFITTING

Retail design and implementation of display concepts, as well as industrialised shopfitting solutions and proximity marketing systems for the modern retail trade.

FINISHING

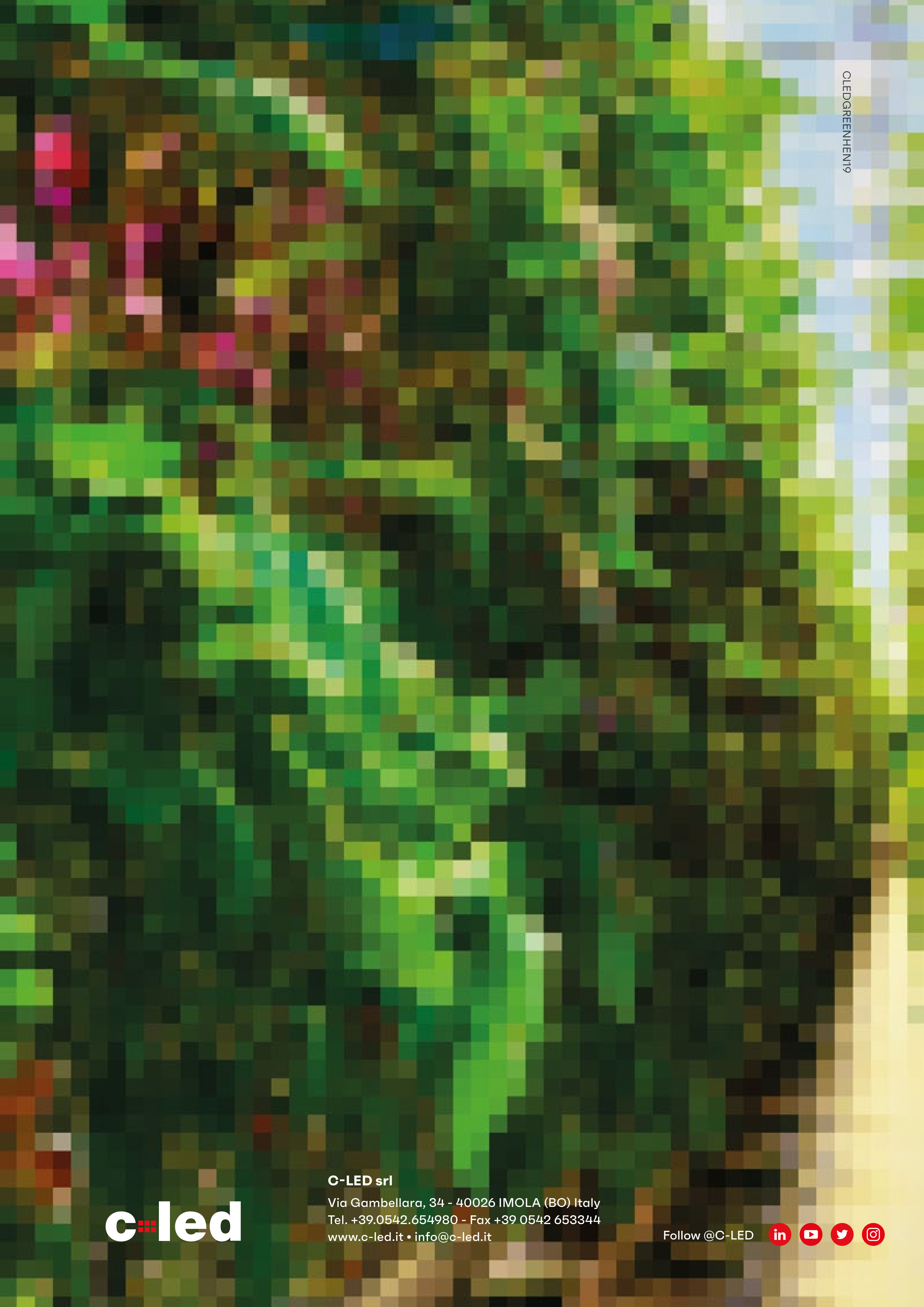
World leader in the design and production of solutions for painting, decoration and digital printing of wood and wood derivatives.

MEDICAL EQUIPMENT

Development and production of high-tech medical devices for the medical sector, for dental professionals and radiologists.

LIGHTING

Lighting solutions with LED technology, architectural lighting and wireless connectivity.



CLEDGREENHEN19

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