ENG

The right reflection leads you forward

REFLECTION
Technology

Lighting Solutions

ariana

light looking forward

contents

Development of the family of internationally-registered patents has been driven by concepts borrowed from astronomy. For the first time, the optical principle of total reflection has been applied to LED lighting. The light emissions of each individual LED are conveyed to an internal reflector that projects the light uniformly onto the ground. This technological evolution improves luminaire performance, while also having a positive effect on light quality and visual comfort. Arianna's research has resulted in three patents covering the principle of total reflection, used to provide solutions for different types of lighting.

patents

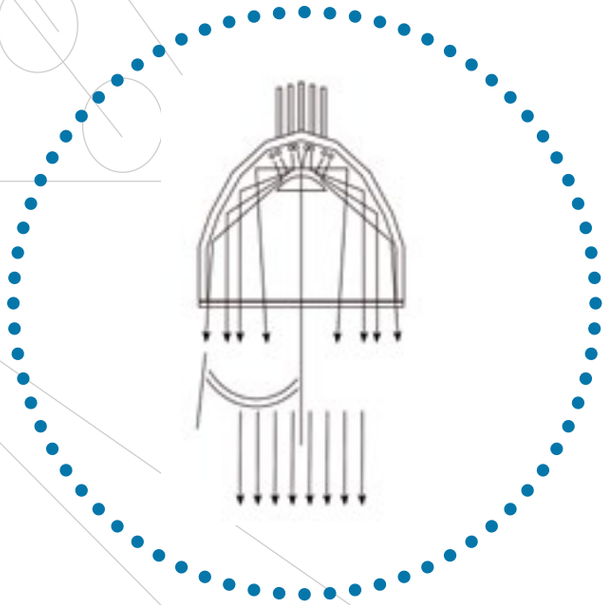
for the first time, the light emissions of each LED are conveyed towards an internal reflector

TOTAL REFLECTION

The patent on total reflection was filed in 2008 and is now recognised internationally. The system consists in using a reflector inside the luminaire that collects the rays of LED light and focuses them onto the ground uniformly. The LEDs are thus concealed from view, significantly reducing glare. Visual comfort and energy saving are the tangible consequences of the total reflection system. Arianna has obtained three international patents covering the principle of total reflection, used to provide solutions for different types of lighting. This system has also been recognised in the United States and China.

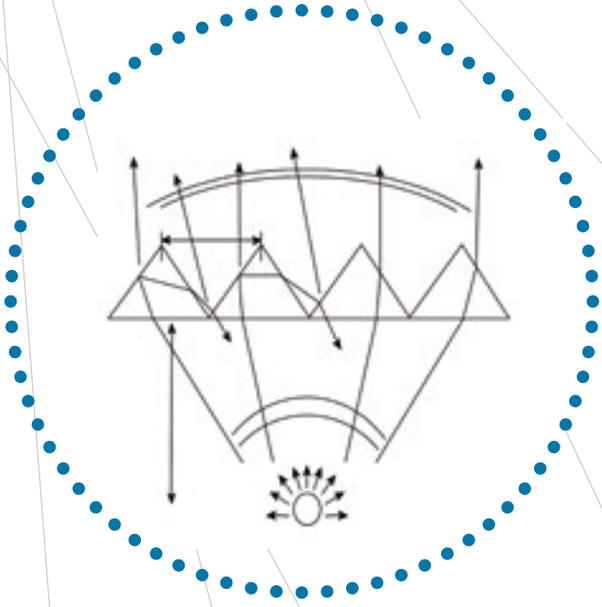
DEFLECTIVE SYSTEM

The DEFLECTIVE system consists of a reflector a reflector that collects and mixes the light emissions using one optical medium, and then projects the light uniformly using a second one. Applied in its basic form above for street lighting, this system ensures uniform illumination, with no shadow areas, no glare and no dazzle. The system has also been recognised by the United States Patent and Trademark Office.



BACKREFLECTIVE SYSTEM

The BACKREFLECTIVE system - by modulating the optical principle of Schmißt-Cassegrain telescopes - focuses the rays of light and projects them over large distances. Generating an intense luminous flux, this is used for lighting from floodlight towers.



LENSFLECTIVE SYSTEM

The LENSFLECTIVE system uses one optical assembly to collect the LED light emissions, and a second optical assembly that acts as a Fresnel lens, using reflection and not refraction. This system is applied for solutions that require projection lighting over shorter distances.

extensive configurability

Highly modular, suitable for different lighting applications, **street furniture, street lighting, tunnel floodlights.**

Optical system comprising **one to six modules.**

Eight reflectors available for each individual module, giving **thousands of light emission combinations.**

arianna, infinite

phileo mini

phileo

phileo tunnel

PUBLISHED IN LUCE

Optics adjustable at 0° and 180° so as to deliver the right light to roads and walkways with just one product.

Variable drive current in the range from 350 mA to 1050 mA, so as to always ensure the exact luminous flux.

Choice between **different LED colour temperatures and colour rendering indices.**

Two versions (eco & efficiency) so as to optimally calibrate the investment.

combinations of light

phileo sospensione

roma

margot

With Arianna, efficiency is not limited to the light source alone, but rather is amplified by series of technological details and new structural features that increase savings.

OPTICAL EFFICIENCY OF 90%, MAXIMUM EFFICIENCY IN LUMENS/WATT, LONG LIFE

energy saving

the highest level of energy saving

ENERGETIC CLASS

Phileo has obtained the highest rating (A++) for both the IPEA (luminaire parameterised efficiency index) and IPEI (system parameterised efficiency index) classifications.

Phileo has obtained the highest rating (A++) Exceeding 150lm/W system efficiency

ENERGETIC CLASSIFICATION STEPS	
Energy class lighting appliances	IPEA*
An+	IPEA* ≥ 1,10 - (0,10 x n)
A++	1,30 ≤ IPEA* < 1,40
A+	1,20 ≤ IPEA* < 1,30
A	1,10 ≤ IPEA* < 1,20
B	1,00 ≤ IPEA* < 1,10
C	0,85 ≤ IPEA* < 1,00
D	0,70 ≤ IPEA* < 0,85
E	0,55 ≤ IPEA* < 0,70
F	0,40 ≤ IPEA* < 0,55
G	IPEA* < 0,40

safety, long life, tested

Certification

Arianna's philosophy is to identify all its products with the ENEC* mark (European Norms Electrical Certification), so as to guarantee conformity to the harmonised European standards. All Arianna products are also compliant with the European standards that regulate the lighting sector.

IP66 IK08

LEDs

Arianna only uses LEDs that are corrosion-resistant in aggressive atmospheres (Cl_2, SO_2, ...) and with high resistance to electrostatic discharges. LED working current is much lower than rated current.

OVERVOLTAGE IMMUNITY

- Certified drivers to withstand overvoltages up to 10 kV.
- Device capable of dispersing discharge energy between the power supply and LED module.
- Use of an insulating thermal pad with 6 kV breakdown voltage.
- Increased insulation distances compared to the minimum required by law.

resistance

MATERIALS AND PROCESSES

- Aluminium body: this must guarantee high protection against the elements, humidity and vandalism, and have a high heat dissipation capacity.
- Adhesives and gaskets subjected to tightness testing after thermal ageing cycles.
- Power supplies certified and validated for outdoor use.
- Material used for the reflectors tested internally for corrosion protection.

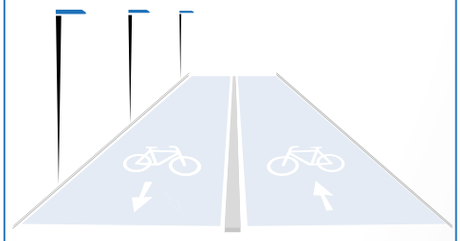
TESTED RELIABILITY

In addition to the tests required by EU directives, Arianna's products also undergo testing for:

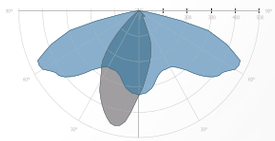
- Immunity to overvoltages.
- Thermal cycles.
- Vibration and salt spray.

OTTICA
/Z

M5-M6
INT/H ≤ 5,5
L/H ≤ 0,8
M3-M4
INT/H ≤ 4,6
L/H ≤ 0,8



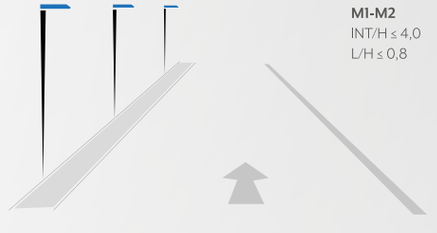
PISTA
CICLABILE



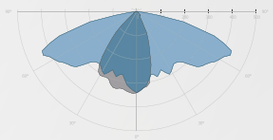
Classe di intensità luminosa G: G2

OTTICA
/W

M5-M6
INT/H ≤ 5,5
L/H ≤ 1,2
M3-M4
INT/H ≤ 4,6
L/H ≤ 1,2
M1-M2
INT/H ≤ 4,0
L/H ≤ 0,8



STRADA
A 1 CORSIA
CON 1 MARCIAPIEDE



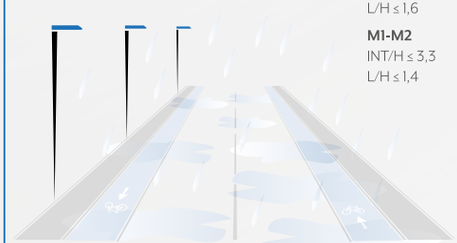
Classe di intensità luminosa G: G2

optics

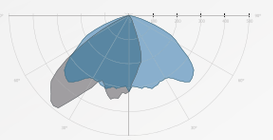
The optical system comprises a series of modules (minimum 1, maximum 6) with eight basic optical configurations and infinite combinations, with luminous flux from 2000 to 30000 lumens. The modular structure means quick-fit systems can be used to insert different optics, either symmetrical or asymmetrical, depending on specific needs and customisations.

OTTICA
/B

M5-M6
INT/H ≤ 4,2
L/H ≤ 1,6
M3-M4
INT/H ≤ 3,8
L/H ≤ 1,6
M1-M2
INT/H ≤ 3,3
L/H ≤ 1,4



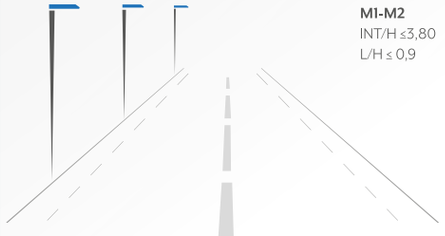
STRADA CON PIOGGIA
DOPPIA CORSIA
CON CICLABILE
E MARCIAPIEDE
DA ENTRAMBI I LATI



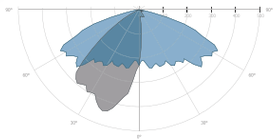
Classe di intensità luminosa G: G2

OTTICA
/E

M5-M6
INT/H ≤ 5,0
L/H ≤ 1,2
M3-M4
INT/H ≤ 4,4
L/H ≤ 1,0
M1-M2
INT/H ≤3,80
L/H ≤ 0,9



STRADA
A DOPPIA CORSIA



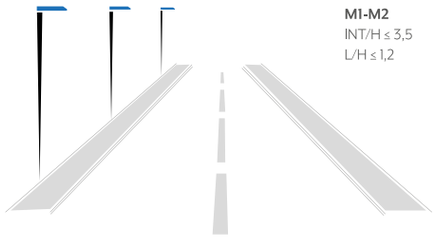
Classe di intensità luminosa G: G2

OTTICA
/S

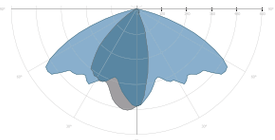
M5-M6
INT/H ≤ 4,8
L/H ≤ 1,2

M3-M4
INT/H ≤ 4,0
L/H ≤ 1,2

M1-M2
INT/H ≤ 3,5
L/H ≤ 1,2



STRADA
A DOPPIA CORSIA
CON MARCCIAPIEDI



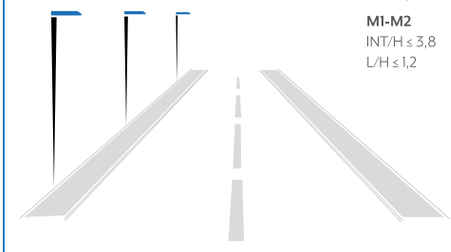
Classe di intensità luminosa G: G4

OTTICA
/R

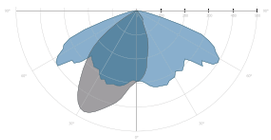
M5-M6
INT/H ≤ 5,0
L/H ≤ 1,3

M3-M4
INT/H ≤ 4,2
L/H ≤ 1,2

M1-M2
INT/H ≤ 3,8
L/H ≤ 1,2



STRADA
A DOPPIA CORSIA
CON MARCCIAPIEDI

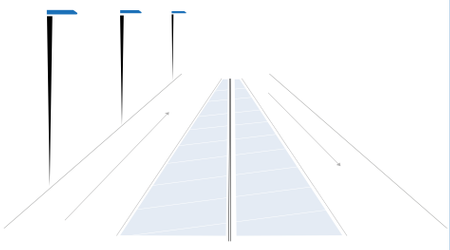


Classe di intensità luminosa G: G2

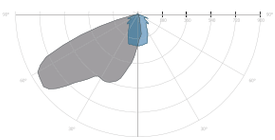
OPTICS SELECTION TABLE

Rapporto larghezza/altezza (L/H)													
	1,6				L			L	L	L	E	E	E
	1,4	L	L		L	L		L	L	L	E	E	E
	1,2	R/S	R/S		E	W	W	W	W	W	E	E	E
	1	R/S	R/S	R	E	E	W	E	E	E	E	E	E
	0,8	E	E	W	Z	Z	W	Z	Z	Z	E	E	Z
	0,6	E	E	W	Z	Z	Z	Z	Z	Z	E	Z	Z
Rapporto INT/H		3,0	3,5	4,0	3,5	4,0	4,5	4,0	4,5	5,0	5,0	5,5	6,0
Norma		M1 - M2			M3 - M4			M5 - M6			P1		

OTTICA
/G



PARCHEGGIO
A SPINA DI PESCE
CON STRADE
LATERALI



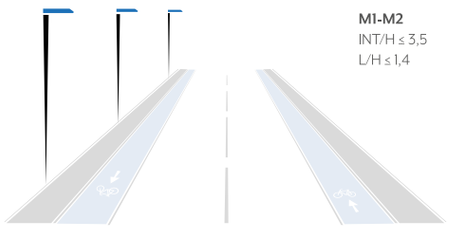
Classe di intensità luminosa G: G2

OTTICA
/L

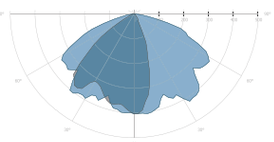
M5-M6
INT/H ≤ 4,5
L/H ≤ 1,6

M3-M4
INT/H ≤ 4,0
L/H ≤ 1,6

M1-M2
INT/H ≤ 3,5
L/H ≤ 1,4



STRADA DOPPIA
CORSIA CON
CICLABILE
E MARCIAPIEDE
DA ENTRAMBI I LATI



Classe di intensità luminosa G: G2

phileo

Fitted with Nema socket and sensor ready

FUTURE PROOF

Heat dissipation system without fins that exploits conduction and convection to reduce LED junction temperature

RELIABILITY

EN4100 die-cast aluminium with 13-stage painting cycle to guarantee high protection against the elements

RELIABILITY

Dimmable power supply with virtual midnight, constant lumen output and remote control

CONFIGURABILITÀ

Overvoltage protection device up to 10 kW

RELIABILITY

Proprietary optics made from anodised aluminium with PVD coating and reflector reinforced with pure silver, 98% reflectivity

EFFICIENCY

Adjustable articulated joint suitable for post and outreach arm mounting

CONFIGURABILITY

Opening clip without needing tools

FUTURE PROOF

Extra-transparent glass to maximise light transmittance

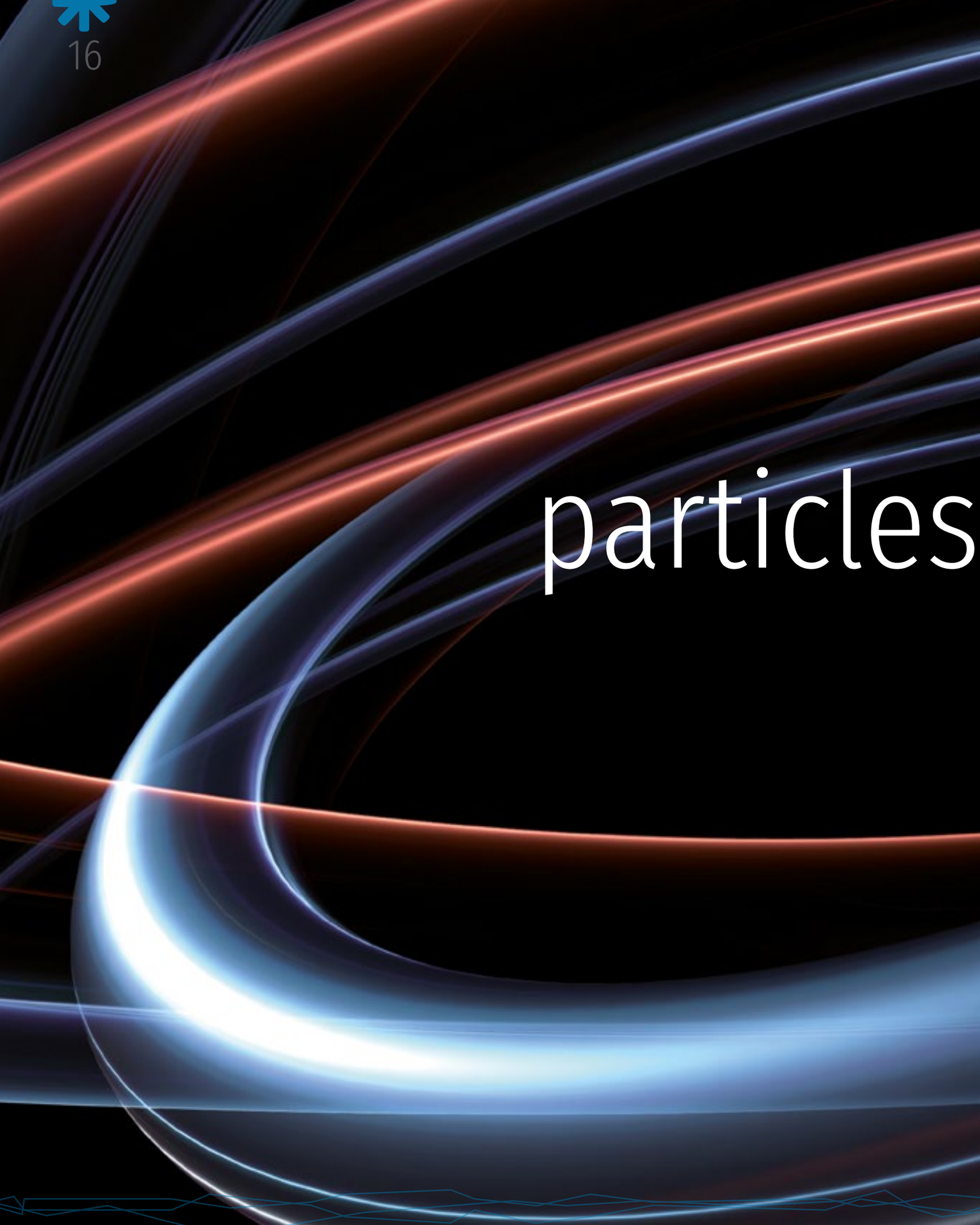
EFFICIENCY

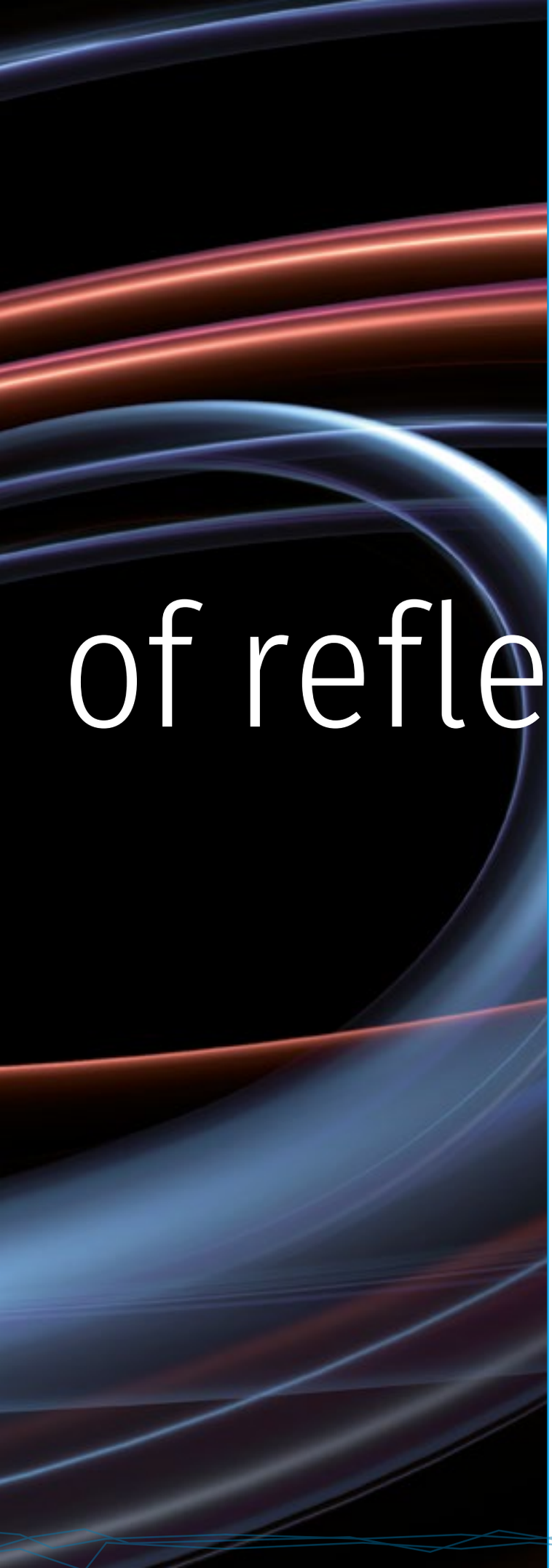
High-power LED with luminous efficiency up to 190 lm/W

EFFICIENZA

Modular and rotatable optics

CONFIGURABILITY


particles



# of reflected light

phileo

Effective, modular and flexible, the only solution for new route lighting

Phileo is the new generation reflection light designed for street lighting. The innovations devised and patented by Arianna on reflected light systems ensure top performance with a new concept in versatility: one single technological lighting solution for a multitude of situations, greater attention to safety and energy saving, formats and solutions designed for all urban contexts, with maximum efficiency in small and large spaces.

roads, cities, tunnels

DESIGN

Innovative solution for easy maintenance and replacement of individual parts. Wave profile at the top with a large cast aluminium surface for heat dispersion through its mass and to assist convection of air from below that carries the heat outside.

FLEXIBILITY

Phileo can adapt to any urban context, taking on different forms yet at the same time maintaining an unmistakable design. This is why Phileo comes in two different sizes, as well as in a suspended street lighting version.

MODULARITY

The reflector is modular, and is completed with specific combinations designed to make the luminaire's optics adaptable to specific lighting requirements.

PERFORMANCE

Careful optical design, high-quality materials, advanced LED sources, efficiency and reliability tested to the highest levels in the street lighting sector, ensure considerable savings in terms of design, installation and operation.

TUNNEL

Perfect for replacing existing lamps and capable of reaching the high power required for reinforcement lighting up to 50,000 lumens.

Flexible, adaptable, efficient: Phileo brings light, safety and harmony to every context and with maximum energy sustainability.

CITY

A single flexible solution that can cover a multitude of situations and scenarios in urban environments.

FROM 2,000 to 30,000 LUMENS.
Phileo's defining feature is its modular optics, which can adapt to different lighting needs. The optical system comprises a series of modules (minimum 1, maximum 6) with eight basic optical configurations and infinite combinations, with luminous flux from 2000 to 30000 lumens. The current delivered to each individual module can also be controlled, so as to provide the right amount of light for every street or road. Two modules deliver a standard luminous flux required by most city streets. All configurations are designed to ensure uniformity and visual comfort. The modular structure means quick-processing systems can be used to insert different optics, either symmetrical or asymmetrical, depending on specific needs and customisations. The internal reflectors are made from silver-coated aluminium, guaranteeing reflectivity of up to 98%.

modular optic

1 module

luminous flux 2000 – 5000 lm

LIGHTING CALCULATIONS

Arianna's team of application engineers is on hand to support customers in their lighting engineering calculations for each project and to provide complete lighting services, with particular reference to energy saving, safety and urban impact.

2 modules

luminous flux 4000 – 10.000 lm

6 modules

luminous flux 12.000 – 30.000 lm

5 modules

luminous flux 10.000 – 25.000 lm

Phileo: in every street, in every open space, the right light for uniformity and visual comfort

4 modules

luminous flux 8000 – 20.000 lm

3 modules

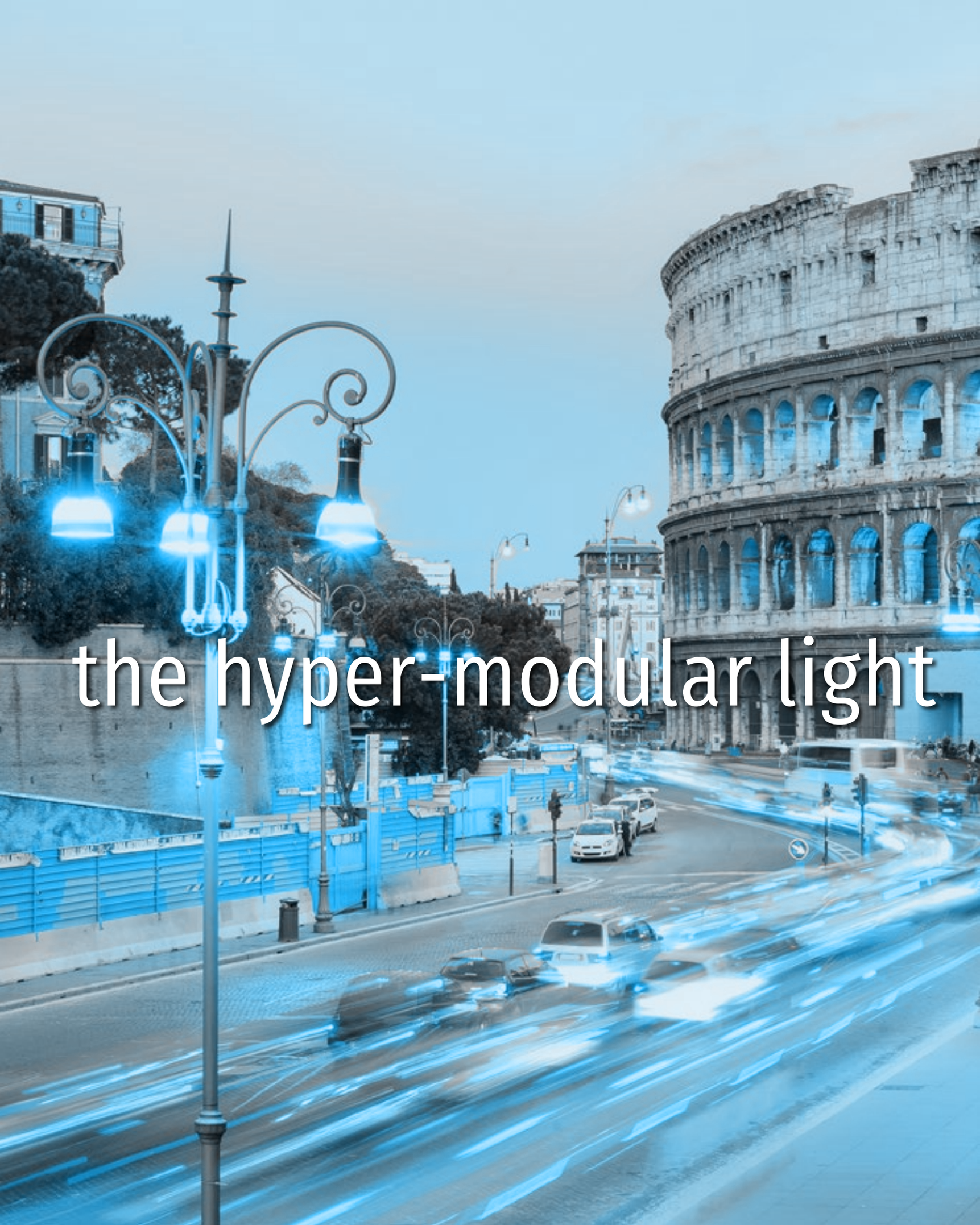
luminous flux 6000 – 15.000 lm

one
click opening

future proof

wiring plate
maintenance

optical block
replacement


the hyper-modular light

margot

Modular light that respects traditional systems

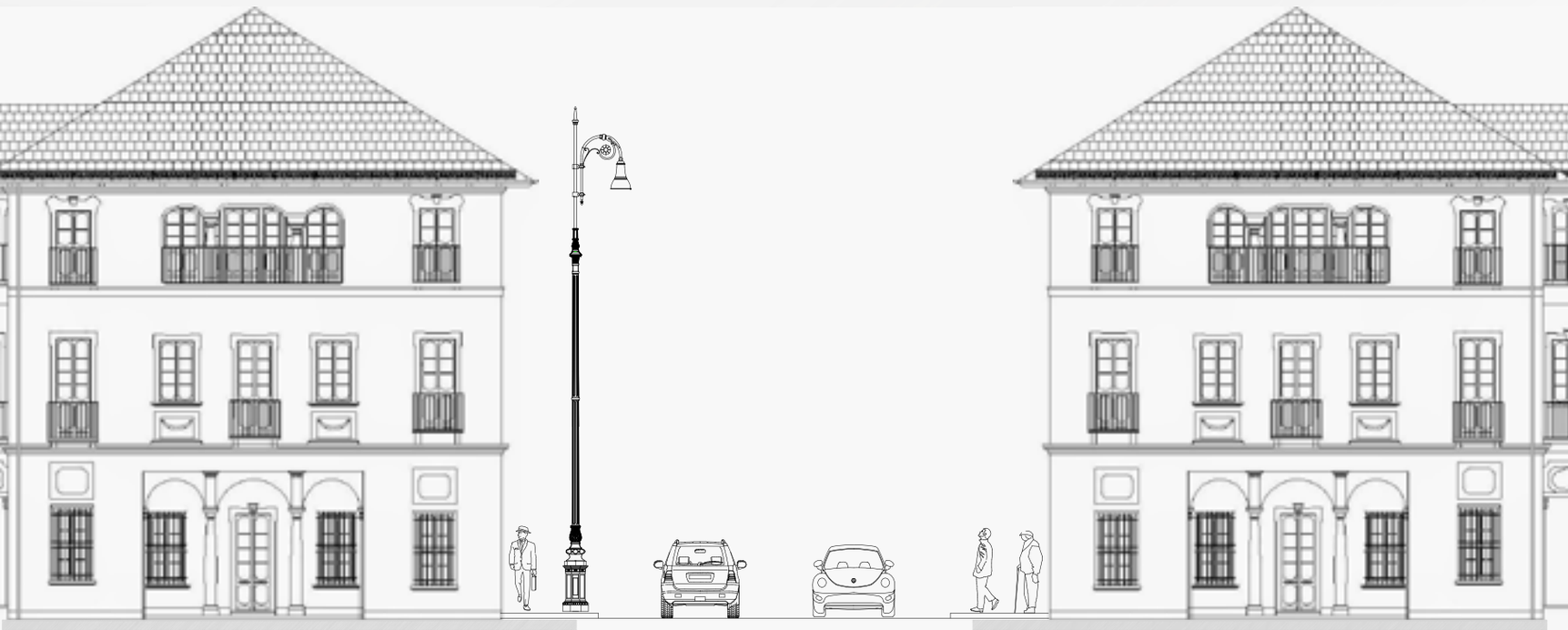
that adapts to all styles

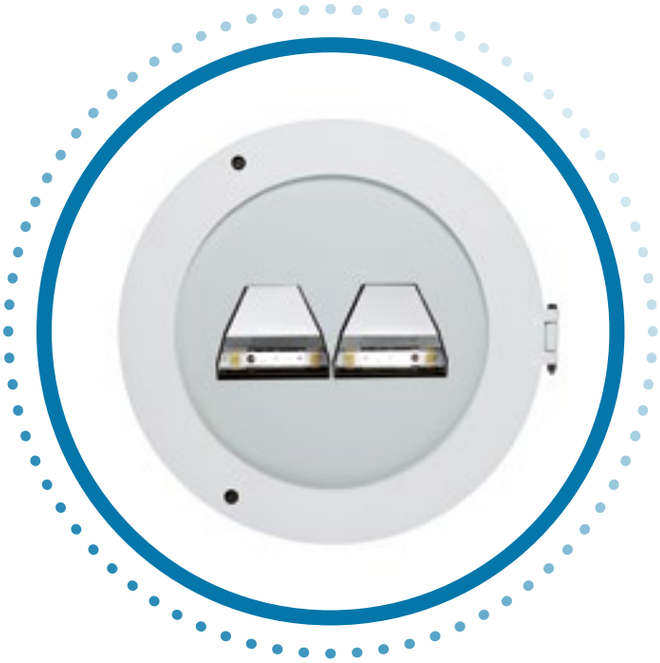
Efficiency, modularity, visual comfort and energy saving in an innovative, classic “bell”

margot

the modular light designed for installations in historic areas

Air bracket

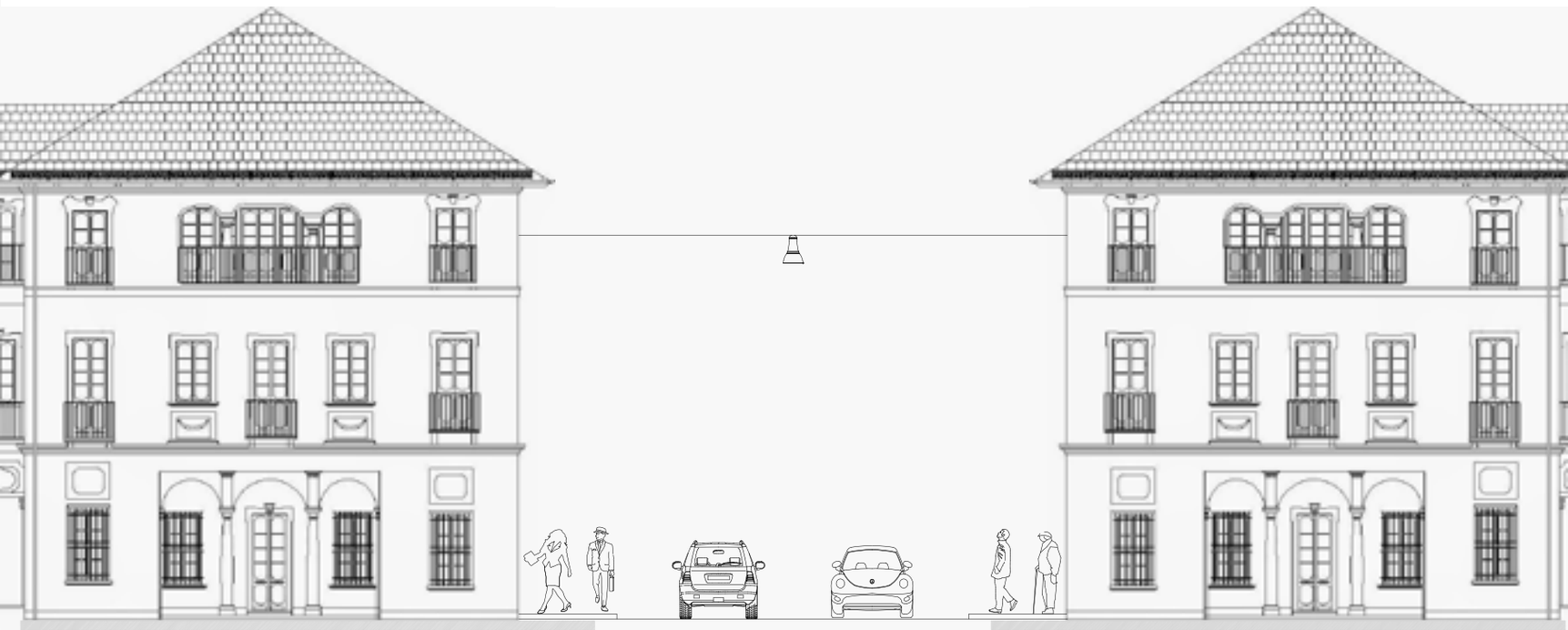




The Margot solution includes an innovative optical system, installed in a “bell” to provide continuity with existing systems. The optical system comprises up to five modules, with luminous flux from 2,000 to 18,000 lumens.

The Arianna modular structure means different optics, either symmetrical or asymmetrical, can be fitted to meet specific needs and customisations. The optics can be adjusted at 0° and 180° so as to precisely deliver the right light to roads and walkways with one single product.

Catenary suspended



In 2016, in Rome, a project began to replace about 70,000 luminaires - entrusted by ACEA to Arianna spa - following a series of tenders that called for efficiency, a reduction in power consumption and special consideration for the city's extraordinary urban context.The old discharge lamps have been replaced with LED lamps as part of a wide-scale lighting project across different levels, for maximum results with minimum impact.

lights on Rome

The first tender in 2017 involved the replacement of 7000 suspended lights in the centre of Rome, Lungotevere and Trastevere, places where lampposts cannot be installed for historical reasons. Arianna focused the work on traditional 150 or 250 watt light fixtures, which were replaced with the new generation 49-watt Arianna Snell LED luminaire, ensuring high quality lighting and annual energy savings of € 500,000.

At the end of 2017, ACEA then received the first supply of Phileo luminaires, the new modular combination designed by Arianna, to replace around 50,000 functional light fixtures. In the areas adjacent to the historic city centre and in the Rome metropolitan area, Phileo and Phileo mini are being installed in four power ratings, with optics specifically prepared and combined to optimise power consumption, meeting the ACEA design requirements. The different optical configurations, were created by combining different modules, drive currents and even LEDs, so as to deliver exactly the required amount of light to the city of Rome's streets and walkways.

In 2018, the partnership with ACEA has expanded to include tunnels/underpasses of particular importance for safety reasons. The project will see the replacement of 7000 luminaires, once again using the Phileo solution, specifically tested for tunnel applications.This street light tender is particularly significant, with ACEA requiring an innovative solution applicable to the "Rome-style street lamps" that characterise the city's historic centre, a requirement that Arianna has responded to with Margot: a solution that provides a new optical engine with LEDs and power supply, more reliable and efficient in preserving the artistic context. The approximately 9000 fixtures have all been set with a more specific shade of light than the peripheral areas, with a warmer colour temperature and significantly higher colour rendering index.

"Arianna luminaires are now ready to light up the lives of 3 million people and almost three thousand years of history".

With pride, Arianna's founder Alberto Giovanni Gerli

Arianna

Arianna spa is a company specialising in the design and manufacture of LED lighting systems.

Industrial solidity

Founded in 2009 by Alberto Giovanni Gerli, Arianna is now a joint-stock company whose majority shareholder is CAREL, an Italian multinational specialising in electronics for air-conditioning and refrigeration.
Research and development are focused above all on care for the environment, safety and urban quality of life.

Custom design

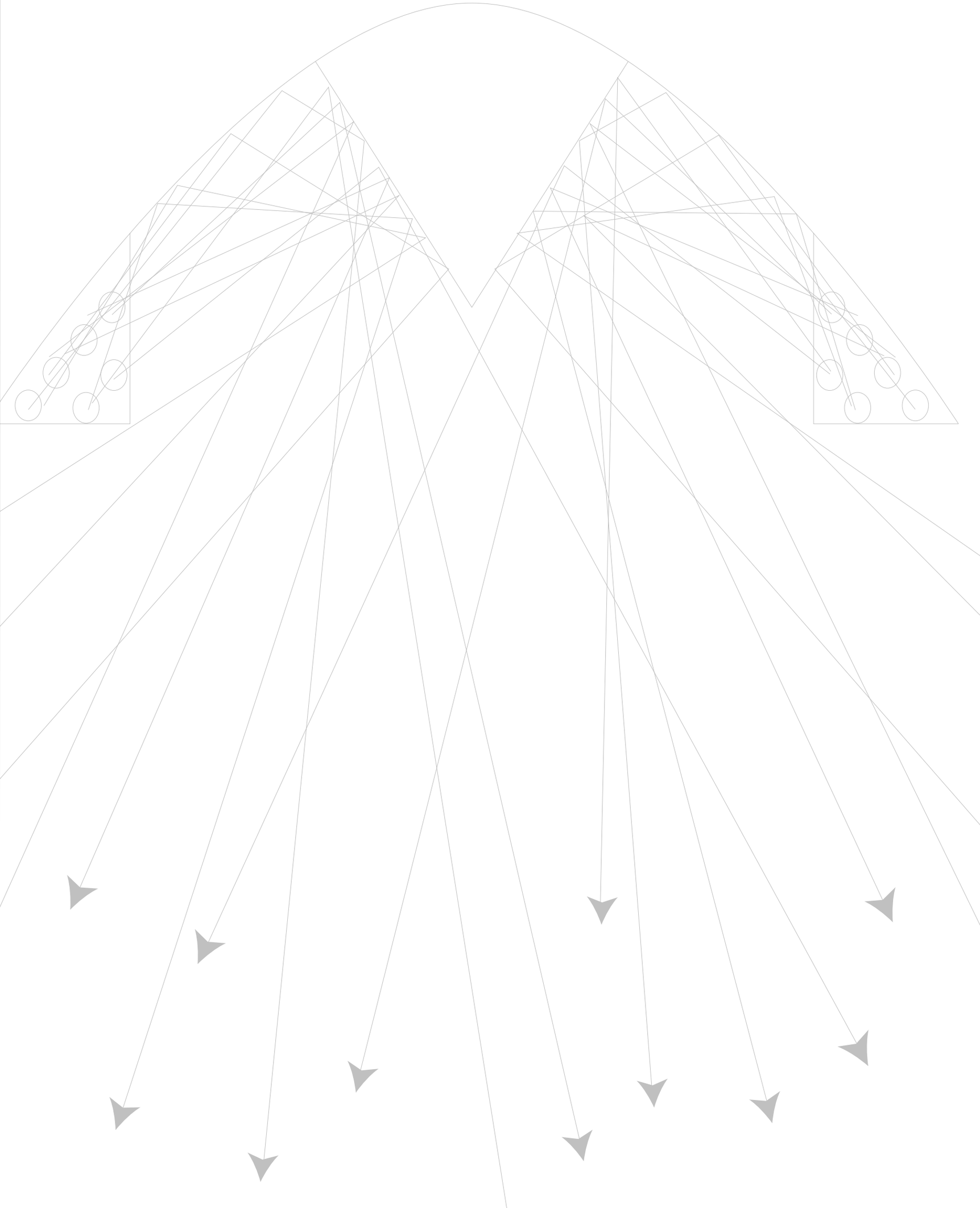
Arianna directly manages every stage of the luminaire production process: from design to manufacture, sales, service and maintenance.
The Arianna team features significant experience and specialisation in lighting calculations: every single element is analysed in detail to ensure a high-performance installation.

Production

With an organisational structure constantly focused on innovation, and integrated logistics managed together with international partners, Arianna supplies high quality lighting even in the most complex contexts, providing innovative technological solutions with a low environmental impact and zero maintenance.

Products

The heart of Arianna products is designed and built in-house. The luminaires are all made in Italy. The company SMD process ensures quality control of the soldering on the LEDs and means faster product delivery times. Production cycle quality certification guarantees a safe and reliable product.



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