

LIGHTING



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The ALMECO service

A truly unique company whose expertise ranges from aluminium manufacturing to reflector design and production.

Across-the-board partner of the lighting industry

The wealth of skills developed in over more than 50 years of experience in aluminium production, the knowledge of the treatments and mechanical, chemical and optical properties of the raw material, the completeness and diversification of production processes and the strong customer orientation has attributed to the ALMECO GROUP's capacity to produce reflectors designed for each client's specific design and light output needs. These characteristics make the Group a unique entity in the lighting industry because it is able to integrate the various phases of

aluminium production with the technologies and know-how to design, engineer and manufacture reflectors.

As a partner of the most important global luminaire brands, the ALMECO GROUP as a single entity can offer a wide range of services depending on the client's needs including a global step-by-step support from the idea to the construction of the reflector, or to intervene with its specialised skills during a certain stage of the development process: design, engineering, prototyping and production.



vega

Product of the ALMECO GROUP's exclusive PVD technology, **vega** represents the new frontier of high reflectance aluminium.

The paradigm of evolution in total reflectance.

Developed in the Bernburg, Germany factory, **vega**, significantly improves the reflectors' optical performance and increases its efficiency up to 20% compared to the already high levels of anodised aluminium, thanks to its extraordinary reflectance. **vega** combines the proven quality of aluminium anodising processes with the most advanced

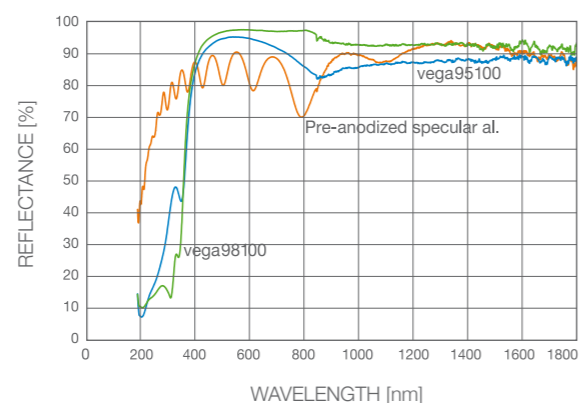
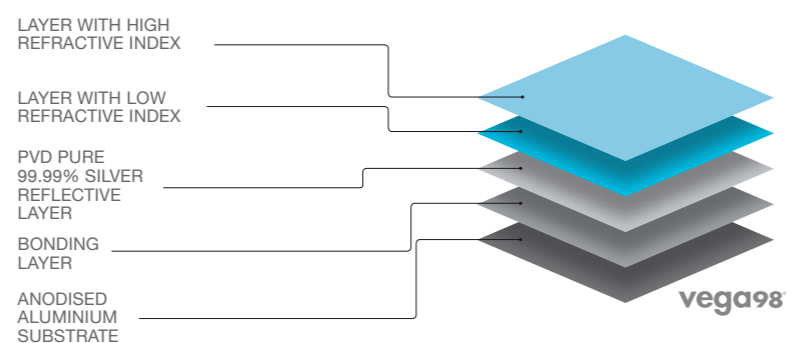
technology of surface coating under vacuum, known as PVD (Physical Vapour Deposition). Thanks to this process, the pure anodised aluminium coil is coated, in a controlled and continuous manner, with a very thin film optimally embedded of 99.9% pure aluminium (**vega95**) or 99.9% pure silver (**vega98**).



An additional double-layer oxide film that further enhances the reflectance is applied last, making it homogeneous and uniform over the entire surface and protects

the material from corrosion and preserving the properties unchanged over time. The result is a range of aluminium which is characterised by values

of total reflectance exceeding 95% (**vega95**) or 98% (**vega98**), with significant energy savings compared to the use of anodised aluminium.



vega95®

From indoor spaces to road infrastructures.

Particularly suitable for fixtures used in both indoors, and tunnel and road lighting, **vega95** is available in finishes which have a different relationship between the diffuse and specular light components, while still maintaining a total reflectance equal to or greater to 95%.

vega95 combines excellent colour rendering and the absence of

iridescence phenomena with a high total reflectance at all visible wavelengths.

vega95 reduces energy consumption and the amount of CO₂ produced compared to similar pre-anodised aluminium fixtures. It also reduces the thermal load due to lighting, allowing a savings on cooling.

Reflector for Condor, Carolina High Mast

Condor, Carolina High Mast

FMB, U.S. Federal Agency, Xtralight



SURFACES



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vega98®

At the top of the range for values of total reflectance.

vega98 is the most powerful surface for the lighting industry. Its total reflectance values exceed 98% in the visible range, and ensure excellent colour rendering and eliminate any phenomenon of iridescence thanks to the uniform spectral reflectance of the thin silver film that covers the anodised aluminium. Even in the presence of multiple reflectances typical of the louvers, it minimises absorption, making it 7 times lower than that of a pre-anodised aluminium surface and less than half of **vega95**.

There are multiple uses for the

vega98 in lighting, where maximum energy efficiency is required, as in the high efficiency multi-cell parables and T5 fluorescent lighting; in LED reflectors or indirect UV on works of art and design objects; the lighting of notebooks, desktops, PDAs and TVs with LCD technology, thanks to the uniform spectral response, in daylighting systems to maximise the amount of light offered by reflective surfaces. It is available in many thicknesses and finishes for applications that combine high efficiency and aesthetic characteristics.

vega form Evolution

The highest reflectance even after deformation

vegaform Evolution

A range of high reflectance surfaces, capable of ensuring optical performances that are particularly elevated even after having being subjected to deep-drawing.

Some reflectors, for their particular geometry, require to be made using a process of aluminium plate deformation. To obtain this result and, at the same time, be able to ensure the highest total reflectance, the ALMECO GROUP has studied and developed **vegaform Evolution**.

Made with pre-anodised aluminium coated with PVD process and subjected to a specific process to give the material the specific ductility characteristics, **vegaform Evolution** retains high values of total reflectance even after deep-drawing.



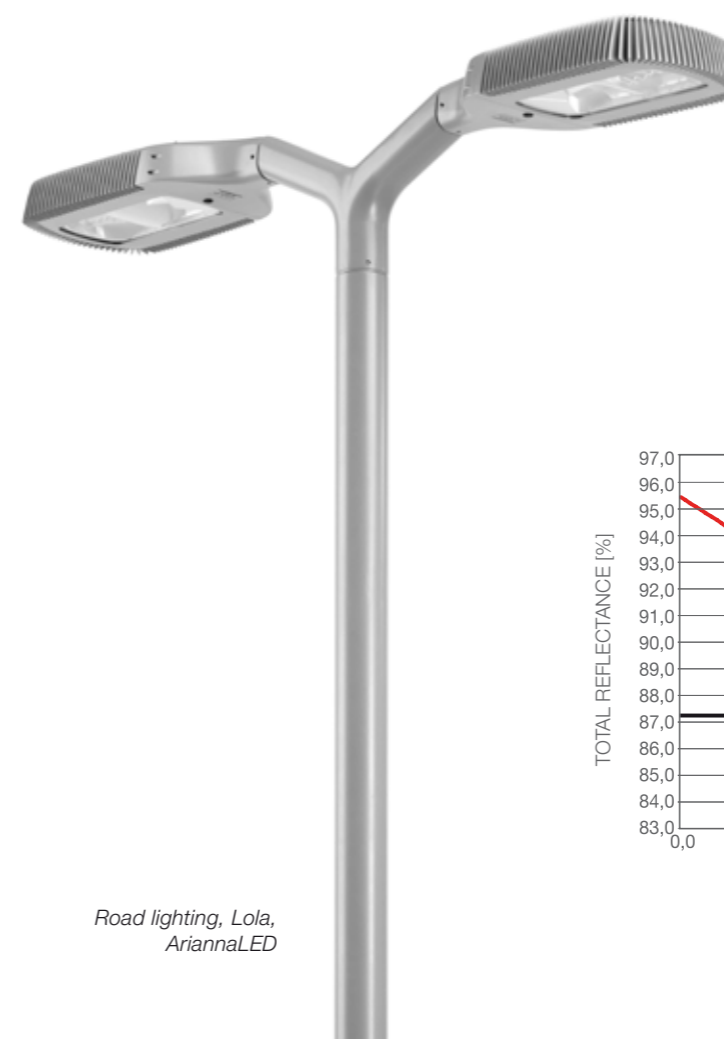
These values are far higher than the aluminium counterparts that are subjected to anodic static, with the advantage of being able to have a particularly high perfor-

mance reflector.

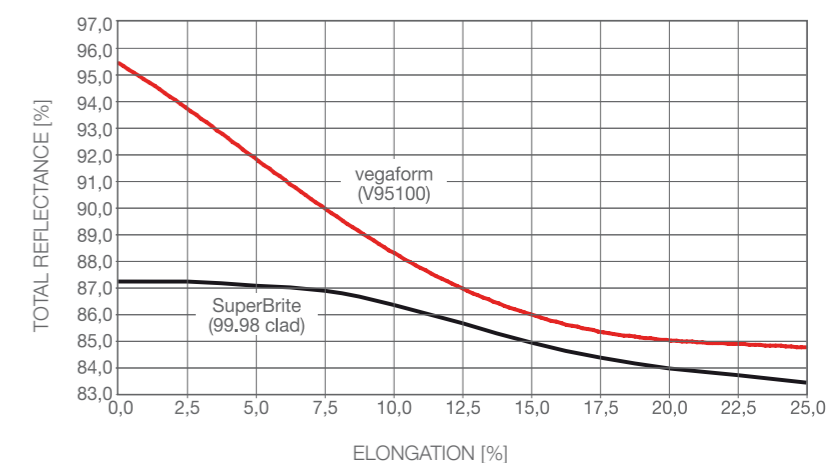
vegaform Evolution is particularly suitable for applications intended for street lighting and reflectors for specific indoor environments.



Reflector for Lola, AriannaLED



Road lighting, Lola, AriannaLED



vega green

More efficiency in the photosynthesis process.

vega green is a high reflectance aluminium developed for the horticulture sector for the realisation of reflectors used in greenhouse lighting.

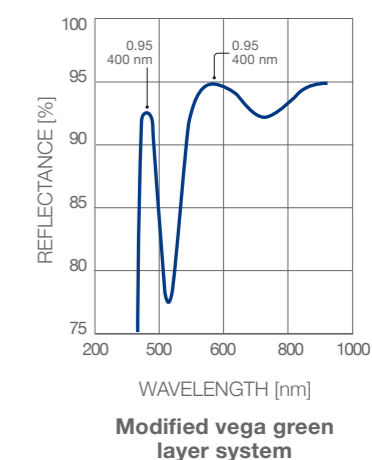
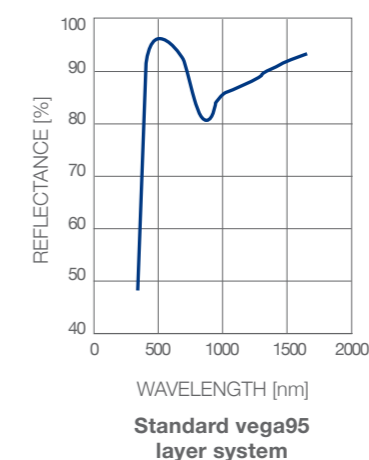
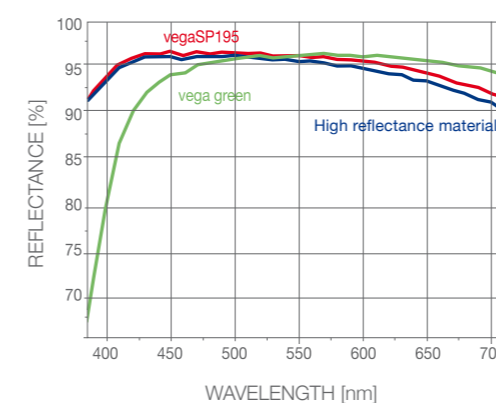
The light plays a central role in the chemical process of photosynthesis by which green plants produce organic substances from carbon dioxide that is present in the atmosphere and water.

The light energy produced by the sun and transmitted to the earth in the form of electromagnetic radiation during photosynthesis is in fact absorbed by different pigments present in the plant, including chlorophyll which is the most important.

Not all electromagnetic radia-

tion wavelengths are absorbed in the same way that chlorophyll is. The wavelength that facilitates the process of photosynthesis is positioned in the vicinity of the limit of the red portion of the visible spectrum (between 600 and 700 nm), where the absorption peak of chlorophyll is situated.

Artificial lighting in greenhouses are mainly used as high pressure sodium vapour sources or low colour temperature metal halides, due to the light flow and relatively



high efficiency.

To foster the process of photosynthesis in artificial lighting conditions, the ALMECO GROUP has developed **vega green** which has properties of the reflectance spectrum that make it particularly

powerful for this specific use.

In particular, the parameters of the special **vega green** coating have been redefined from one side to facilitate a shift of the peak spectral reflectance towards the orange and red component, the other

to maintain a high reflectance in the blue component.

Thanks to this particular modification of reflectance spectrum, **vega green** allows to obtain the most efficient photosynthesis and guarantee the best performance of the appliance.

vega^{SP}

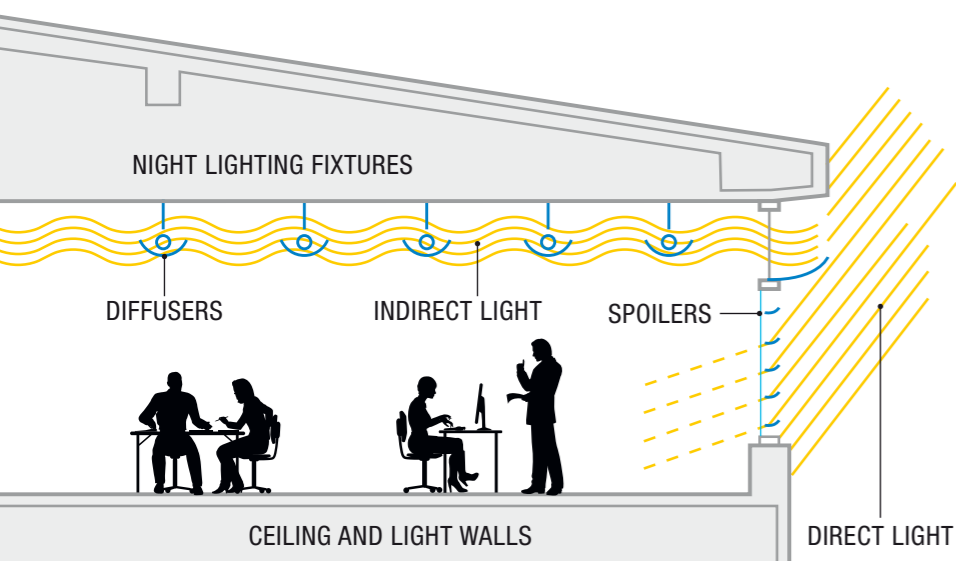
Maximise the return of sun light: light pipes and daylighting systems.

vega SP is a special high-reflectance aluminium used for systems that address natural light in indoor settings to improve the visual and thermal comfort in a controlled manner.

For decades, the construction engineering and architecture has developed lighting systems to maximise and manage light radiation performance during the day, thus reducing the use of light fittings. This is the case in reflective dropped ceilings, whose efficiency can be increased with the introduction of systems to redistribute the light input, attenuating the possible variations in the quality and inten-

sity due to changes in the position of the sun.

To bring natural light into a building and direct it in a controlled manner, reflective blinds are also used. They can be embedded in door and window systems and are manually or automatically movable, so as to prevent overheating of the premises. Both of these applications can be combined with parabolic systems, located on the front or inside of the building, redistributing the light into the depths of the space. Another system used to reach the daylight in the farthest corners of homes, commercial buildings and in all places where the contribution of daylight is not sufficient, are light pipes that are internally coated with high reflectance material. The higher the total reflectance of this material, the better its performance will be.



Light pipe, Lightway, Czech Republic

Daylight using system, T-Soleil, Japan

With the **vega SP** the ALMECO GROUP offers a range of specific materials for daylighting systems and light pipes. They are characterised primarily for very high total reflectance, exceeding 98% in the visible spectrum, which results in obvious advantages in the system's efficiency.

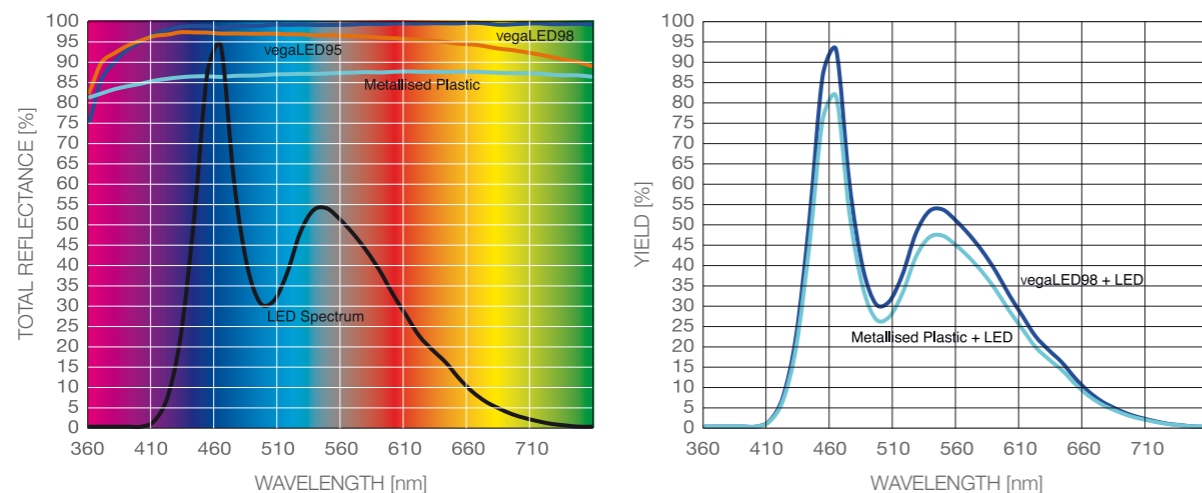
Furthermore, extremely small losses are presented due to multiple reflectances, which are particularly noticeable in the light pipes. These features will add a high uniformity of the visible spectrum and excellent colour rendering, which translates into a better visual comfort. The high ductility

and flexibility of the **vega SP** range allows a wide use, both for particular parabolic shapes and long, non-linear path light pipes. The **vega SP** products are characterised by their high resistance to corrosion, a quality that ensures the same reflectance standards over time.

Fresenius laboratory, BaggiLUX, Italy



vegaLED



Best colour rendering, highest energy savings.

vegaLED is aluminium studied by ALMECO GROUP for LED light fitting reflectors.

vegaLED is ALMECO GROUP's concrete contribution to the improvement of LED, fixture performance, a market segment that has experienced a strong growth, that allows the possibility of a more controlled light distribution and an increase in reflector efficiency, thanks to its high values of total reflectance.

In particular **vegaLED98** guarantees

15% more light for every reflectance with respect to metallic plastic. Considering that a significant part of the light rays is reflected several times in a reflector, that added value in terms of energy efficiency and savings that **vegaLED** is able to offer is clear, allowing to fully exploit the light emitted by the source.

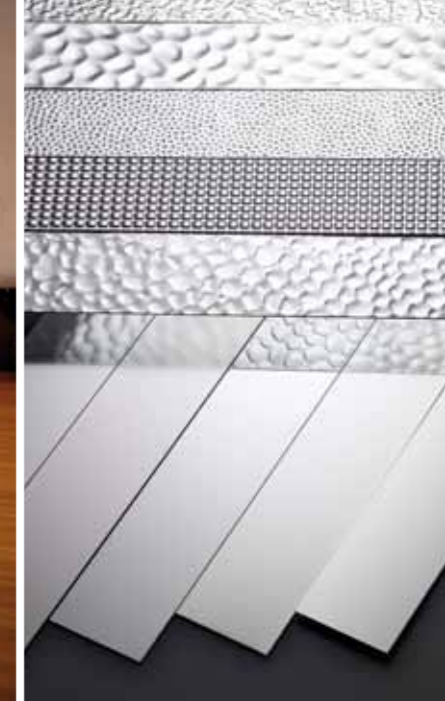
Furthermore, **vegaLED** ensures a ho-

Aton LED, SBP



homogeneous and uniform reflectance of the entire visible spectrum. The upper layers of the surface, in addition to completely protecting the silver deposit that incorporates, as a result of the PVD coating process, confers a slightly warm tone to the grazing light, which is perfect for spaces with a strong architectural features.

vegaLED is available in a wide range of surface finishes and offers the possibility of infinite combinations depending on the reflector's design and the type of lighting. While **vegaLED98** is especially suitable for indoor lighting fixtures, **vegaLED95**, is preferred for road fixtures as it offers a 95% reflectance.



vegaLED on BOARD

The idea solution for MC-PCB supports.

vegaLED on BOARD

An aluminium MC-PCB (Metal Core - Printed Circuit Board) specifically developed for high-power LEDs.

To achieve optimal heat management and increase the light output of the LED source, it is appropriate to place the LED chip on a PCB aluminium base that is coated with a highly reflective surface.

The coating of the PCB support in

fact influences the light emission of the source and enhances its power characteristics.

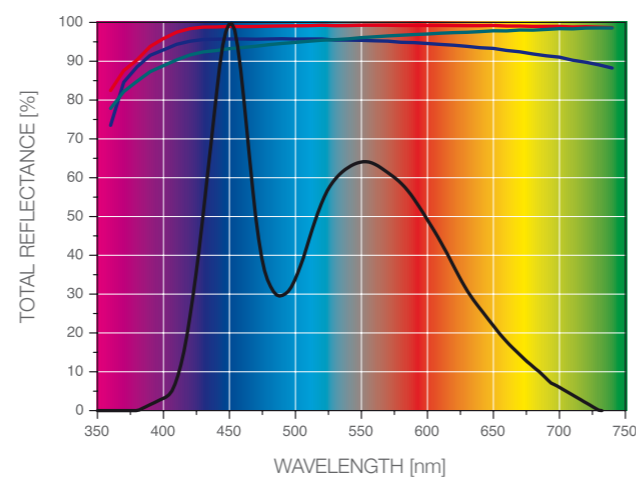
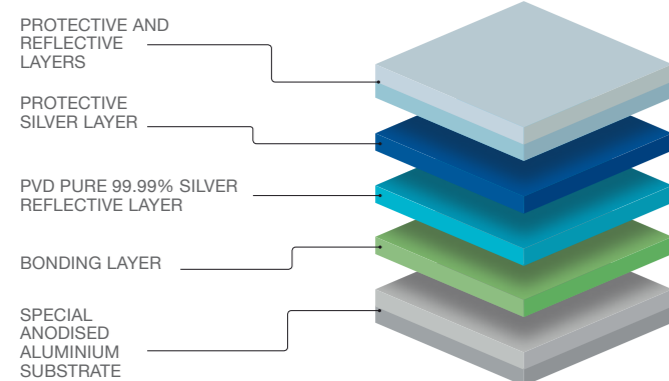
vegaLED on BOARD is the solution that ALMECO GROUP proposes to high-power LED manufacturers to ensure the maximum efficiency of the source.



Specially designed for coating the MC-PCB substrates, it presents an extremely high total reflectance (over 98%) over the whole LED emission spectrum thanks to the PVD treatment to which the material is subjected, significantly

increasing the performances of the source with respect to a silver plated copper PCB. In this feature, the high spectral uniformity and elevated optical performance are added up, assuring a homogeneous rendered source.

vegaLED on BOARD also carries out an effective action to dissipate the heat generated by the LEDs on the rear of the PCB, ensuring a longer life for the source.



— vegaLED98 on BOARD — Silver plated copper LED spectrum
— vegaLED95 on BOARD



Anodised aluminium

A suitable material for wide range of lighting uses.

Versatile, flexible and durable, the pre-anodised aluminium provides an excellent combination of high reflectance and durability in a wide choice of finishing.

In lighting, anodised aluminium has always found the largest field of application in a range of products from reflectors for fluorescent sources to louvers and projectors. There are many reasons to favour this use. Some of them relate to more effectively mechanical and chemical characteristics of the aluminium: its lightness and flexibility which, combined with its strength, making it easily formable and suitable therefore for mechanical processing necessary for the production of curved and folded

components; its resistance to high temperatures that many light sources generate. But, without anodising, the aluminium would be subjected to oxidation, and predisposes its surface to stains, scratches and streaks. The process of electro-polishing and anodising cleanses the surface and protects it through the growth of a hard and transparent oxide layer, intimately binding it to the metal so as to impede delamination, and giving it excellent resistance to oxidation.



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Above all, the process of anodising ensures the aluminium those high total reflectance values that are essential to ensure the functionality in the lighting field. According to the production and finishing of the alloy, the anodised aluminium presents a total reflection that varies from 80% to 87%.

The ALMECO GROUP, which has been operating in this industry for over fifty years, can count on a consolidated know-how in the process of continuous aluminium anodising. This expertise is the result of constant and significant investments in productive technologies, control systems and staff training.



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reflect+A™

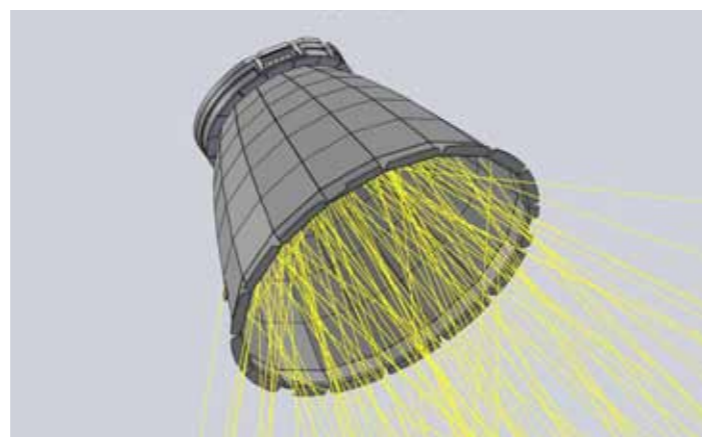
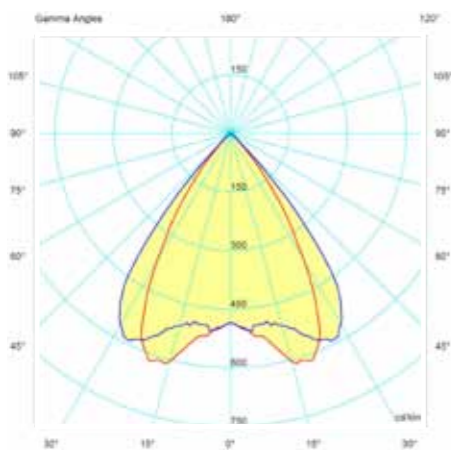
From the idea to the reflectance: an integrated modular process.

reflect+A is the “concept” by which the ALMECO GROUP expresses its ability to design, engineer and create the widest range of reflectors for its clients.

From reflectors for industrial or commercial use to those for offices, urban dector, sports facilities and street lighting. From floodlights and spotlights to retrofit lighting systems, from reflective blinds to daylighting systems and light pipes.

The ALMECO GROUP is the ideal partner for lighting companies, thanks to its ability to follow the customer at every stage, from design to product construction.

Starting from the analysis of customer requests ALMECO GROUP's technical-commercial team defines the reflector's geometric characteristics and selects the most powerful type of reflective surface depending on the type of light source and lighting that it intends on obtaining. A virtual model has been developed that takes project data into account and analyses the photometric behaviour with a high degree of reliability and accuracy.



The feasibility project also includes the analysis and the choice of the technology process to be used, depending on the production cost and time, volumes and possible investments.

It then goes on to build a prototype aluminium reflector to carry out the necessary photometric, thermal, structural and obstruction findings before starting the production of the product series.

To meet the requirements of high

efficiency and a market in constant and rapid evolution, the ALMECO GROUP has developed the patented **reflect+A**.

reflect+A is a concept for segmented reflectors that are compatible with the LED sources and the holders that are present on the market, available in small batches, very easy to put together and, above all, able to ensure the maximum efficiency and the highest level of customisation.



reflect+ATM team

A revolutionary idea for LED reflectors.

reflect+A team is an infinite range of reflectors for LED sources that are "ready to fit, easy to use."

The gradual spread of LED sources and their rapid evolutionary development have pushed the ALMECO GROUP to make a catalog of customisable segmented reflectors available to the market, made with **vegaLED98** high reflectance aluminium at

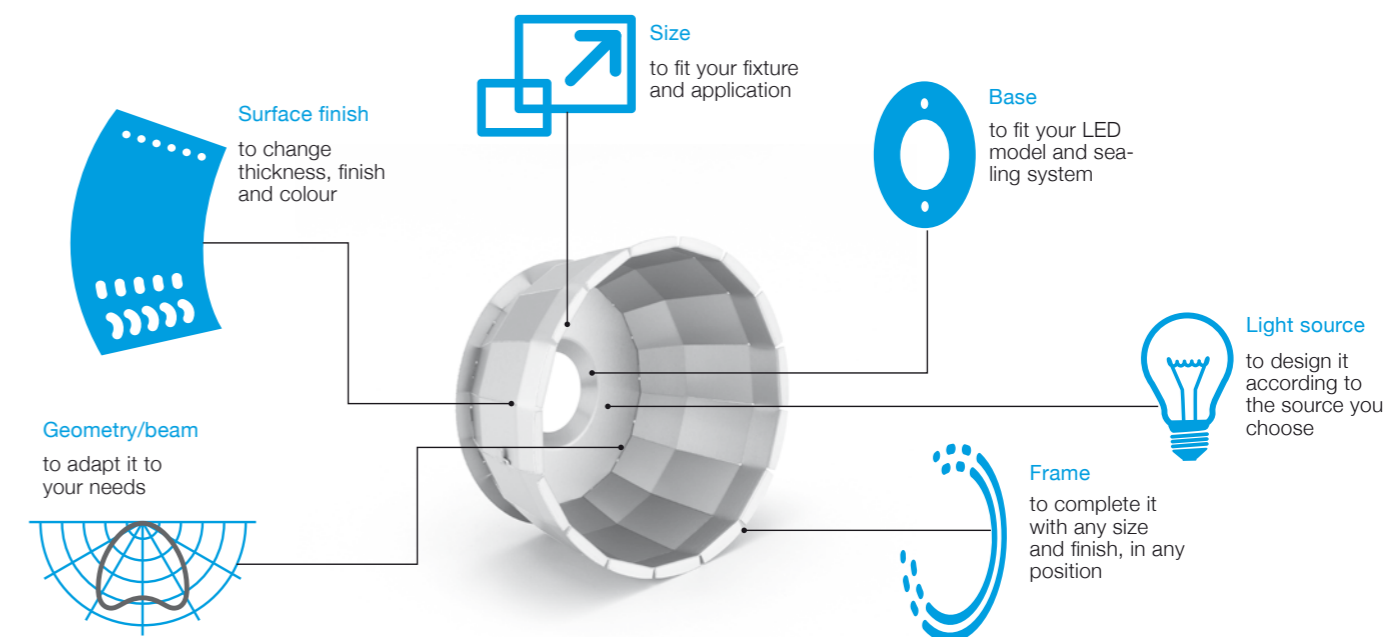
the service of highest energy efficiency. Additionally, the client can choose the ideal set of components from a wide range of defined combinations for a reflector that is tailored made to their specific needs.



Starting from the selected light source, one proceeds to choose the surface base. Then, the finish and the surface colour is selected, along with the type of ring and

the size of the reflector to be obtained. Finally the shape and geometry of the light beam is chosen. Ready-made solutions for different environments, and for the

most popular LED and holders on the market can be found in the catalog of in stock products. Furthermore, customisation is always possible, even in limited batches.



Ready to fit easy to use

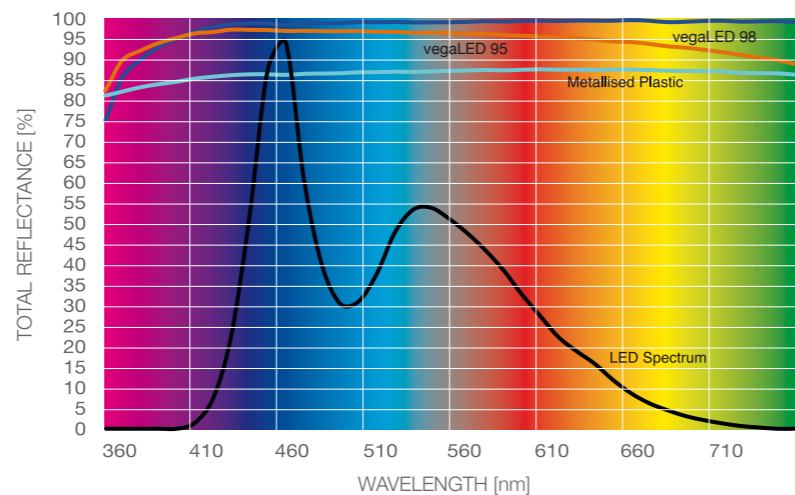
Total compatibility

The **reflect+A team** system is compatible with all major LED sources on the market and with the most common LED-holders on sale. Tailored solutions for chips developed by the customer or new holders are feasible.



The highest reflectance

reflect+A team reflectors are available in several finishes from the **vegaLED98**.



The widest range of finishes

The choice of finishes and colours made available in the catalog are especially broad. In fact, beyond the entire **vega** range, the **bandoxaldecor** collection of coloured surfaces is available for special needs.



Production without moulds

The **reflect+A team** reflector components are made by laser cutting, therefore not having to depend on special moulds. This allows the maintenance of an extremely low number of pieces for each batch order.



Simple to assemble

The various components of the reflector may also be supplied unassembled, with advantages in terms of logistics and storage.



Extremely easy to mount

The **reflect+A team** reflectors are very easy to mount and replace: they are quickly sealed without screws and the need for tools, allowing for perfect placement of each type of LED. They are also compatible with the most popular LED holders on the market.



Fast shipping

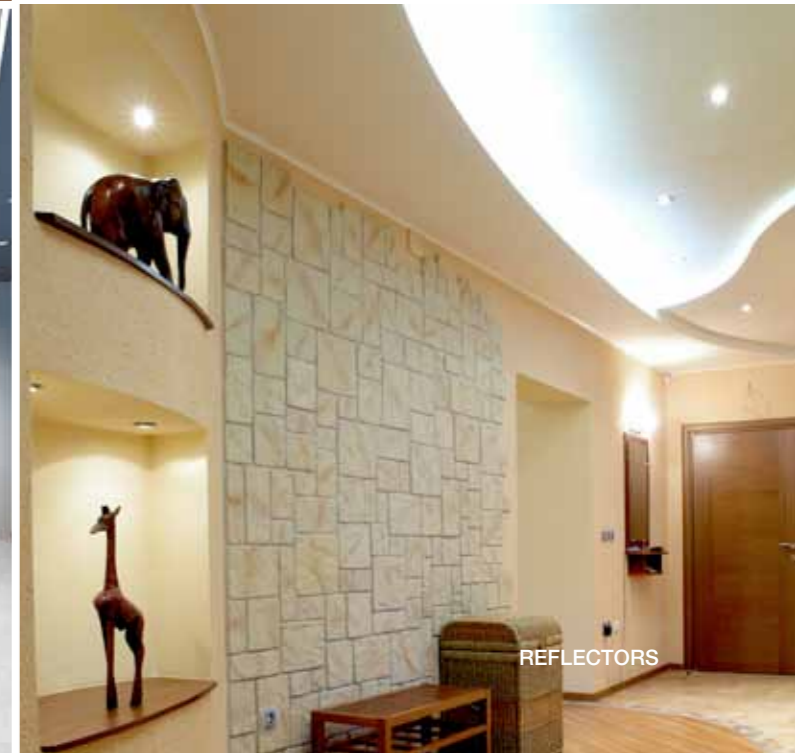
In-stock products are available for immediate international delivery.





A world of applications

The panorama of fields in which the **reflect+A team** may be applied is particularly vast, from shops to offices, from galleries to museums, from entertainment and leisure spaces to educational structures, up to buildings and architecture and design spaces.



REFLECTORS

REFLECTORS



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