The Right Lighting Solution for tunnels

Tunnel lighting systems must meet stringent requirements in terms of reliability, ease of maintenance and lighting quality. Safety and smooth traffic flow are at stake.

With its innovative international patent and the high quality of its products, Arianna provides just the right lighting solution for tunnels. With its know-how and experience, it ensures the safety of people as well as high energy savings.

APLYLED

arianna light looking forward

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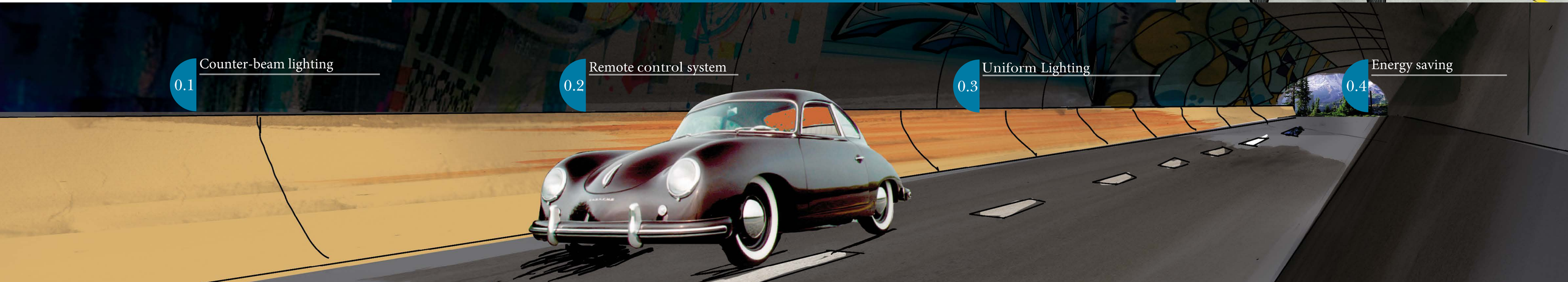
TUNNEL



0.1 Counter-beam lighting

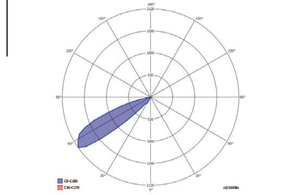
0.2 Remote control system

0.3 Uniform Lighting

0.4 Energy saving

Counter-beam Lighting

The tunnel entrance area requires a very high level of illumination to make the transition from bright light outside the tunnel to the dark environment inside the tunnel.
For this specific area, Arianna has designed an asymmetrical, counter-beam lighting solution which projects the light in the opposite direction to the direction of travel. Ensuring a high level of safety, this method tends to enhance the visibility of obstacles by increasing the contrast between illuminated background and the vertical surface of any obstacles remaining in the shadow (because it is illuminated in the opposite direction).



Remote Control System

Remote monitoring is designed to ensure a greater level of safety within tunnels, while allowing for considerable savings on system operation and maintenance costs.

Safety and efficiency: a winning combination in the field of tunnel lighting, which Arianna has managed to accomplished by applying its patented technology to cutting-edge systems.

*TUNNELED TESEO is a luminaire designed for reinforcement lighting. It is characterised by photometric data that aim to **maximise luminance response**. The light blade has been designed to **minimise glare** and the light under the luminaire, so as to reduce any electricity wastage.*

Uniform Lighting

To eliminate the uncomfortable feeling of enclosed spaces, the illumination levels within tunnels are slightly higher than street lighting for open roads. The aim is to achieve a uniformly illuminated interior space without shaded areas.
The international reflection patent used by Arianna luminaires allows for glare-free, uniform illumination.

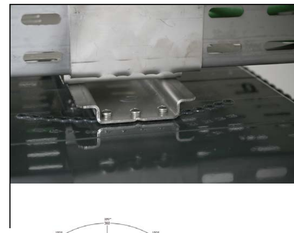
TUNNELED TITLIS is the luminaire designed for permanent tunnel lighting. The optical principle behind the products is a patented total reflection system, in its deflective application.

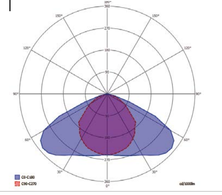
*Not only does it reflect the FWHM emission angle, but also the whole emission of LEDs, resulting in **reduced glare**. The luminaire emits LED rays with an aperture of about 120°.*

Energy saving

Permanent tunnel lighting runs round the clock. Arianna innovative technology makes it possible to minimise energy consumption per light point, reducing overall consumption.

The reliability of products and the high quality of materials results in low maintenance as well as a reduction in management costs.



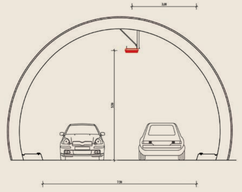


Case study

Bidirectionnal tunnel

Project data

Standard	UNI 11095:2011
Street coating	C2 q0 = 0,056
Street type	Bidirectional
Wall reflectance	40%
Number of lanes	2
Reinforcement length	450 m
Maintenance factor	0,8
Design speed	90 km/h
Stopping distance	94 m
Entrance zone luminance	100 cd/m²
Interior zone luminance	2 cd/m²

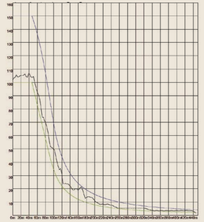


Permanent lighting

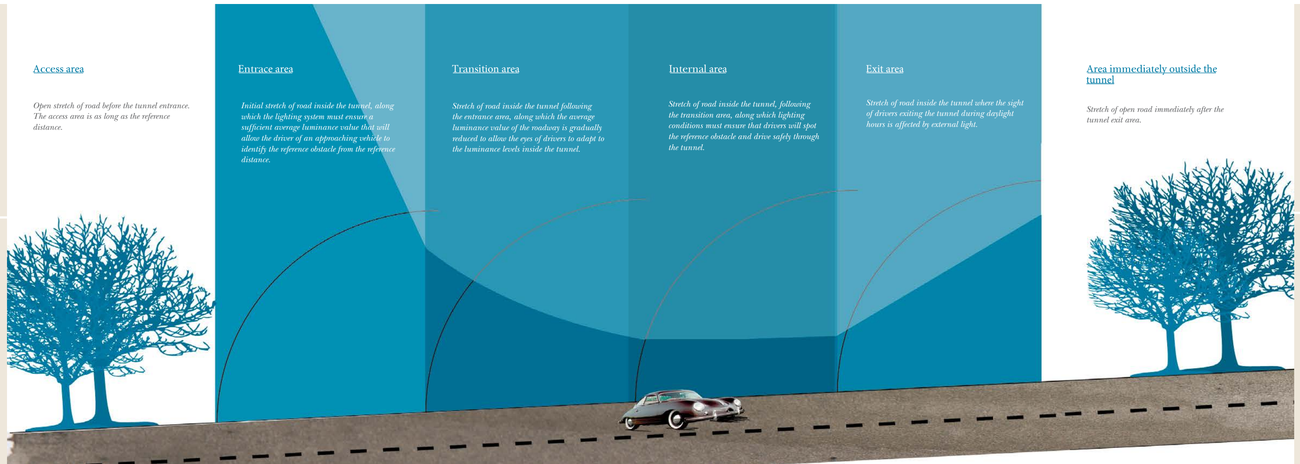
Model	TUNNELED TITILIS 95W
Spacing	12 m
Luminance	2,01 cd/m²
U_o	0,56
U_l	0,81
TI [%]	3,65

Reinforcement lighting

Model	Power	Number	Total Power
Teseo 210W	209	37	7733
Teseo 140W	139	9	1251
Teseo 80W	80	14	1120
Titlis 120W	109	25	2725
Titlis 50W	44	10	440
total		95	13269 W



Observer 1 position (x=60.00;y=2.88;z=1.50)m

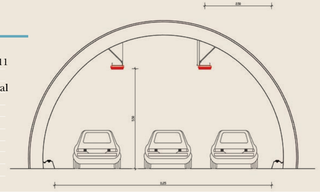


Case study

Unidirectional tunnel

Project data

Standard	UNI 11095:2011
Street coating	C2 q0 = 0,056
Street type	Unidirectional
Wall reflectance	40%
Number of lanes	3
Reinforcement length	540 m
Maintenance factor	0,8
Design speed	130 km/h
Stopping distance	163 m
Entrance zone luminance	100 cd/m²
Interior zone luminance	3 cd/m²

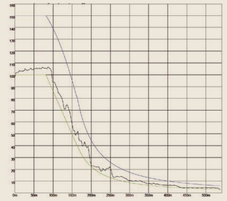


Permanent lighting

Model	TUNNELED TITILIS 95W
Spacing	12 m
Luminance	3,01 cd/m²
U_o	0,69
U_l	0,84
TI [%]	2,87

Reinforcement lighting

Model	Power	Number	Total Power
Teseo 210W	209	114	23826
Teseo 170W	174	10	1740
Teseo 140W	139	12	1668
Teseo 80W	80	28	2240
Titlis 120W	109	54	5886
Titlis 50W	44	18	792
total		236	36152 w



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