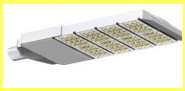
Lighting of road constructions,park, squares	SELECTION CRITERIA	
	THE PROPOSAL OF OUR COMPANY IS “YES” TO THE MAGNETIC INDUCTION LAMPS AND “NO” TO THE LED LAMPS	
Specifications	**Magnetic Induction (MI) Lamps** 	**Light Emitting Diodes (LED)** 
Principle of operation, Materials-Structure, Power Supply	**Principle of operation**	
	Fundamental principle of electromagnetic induction. The stimulated emission of electrons in the lamp [ionization because of the creation of Magnetic Field Induction] with the simultaneous deexcitation of its electrons (amagalm), which is found at a particular point outside the lamp, create infrared radiation. The absorption of this radiation from the fluorescent substance, that is placed around the lamp, creates a radiation of visible light.	When we apply to a Light Emitting Diode [LED] a forward voltage bias, the recombination of carriers (holes and electrons) around the junction creates an emission of photons. The spectral region emitted by the LEDs depends on the materials of their construction and their impurities. The intensity of light emitted by a LED diode is proportional to the nominal forward current of the diode, while the colour depends on the material (GaAsP-red colour, InGaN-white light).
	Power Supply	
	A Switching Power Supply is used, with output a turn-over undulation that apply a constant current bias to the coils (ferritic core), which are situated outside the lamp at the ends of the diameter. The purpose of the so developed electromagnetic field is to induce inside the lamp the energy aiming at producing of light. Also, the device of the Switching Power Supply possesses circuits for the control of temperature, current impedance and short-circuits.	a) Low-power LED device. Forward driving (bias) with a voltage obtained from devices with ICs Voltage Regulator or a low-cost device [Rectification and Filtering]. b) High-power LED device. 1) Forward driving (bias) with unreliable devices of power supply establishing constant voltage and output current and equipped with control circuits for powers over 30 or 50 Watt (LEDs connected in series). 2) A switching power supply is needed for devices of medium power. Note also that LED is a current-driven devices are and therefore will be destroyed if they are not correctly supplied by current. There is problem with power supply – driving Even the most reliable power supplies driving led to road layout unable to control the electrical characteristics of all LEDs forming the lighting device
	Structure	
	Device for low and high power of illumination	Device for low and medium power of illumination
	Spectrum	
	Wide-spectrum Luminious radiation	Narrow-spectrum Luminous radiation
Principle of operation, Materials-Structure, Power Supply	**Luminosity**	
	As a result of the creation of a constant magnetic field controlled by the device of the Switching Power Supply (SPS), no decrease is observed in the luminosity of the lamp throughout nearly all its life time	The luminosity of LEDs is decreased by 1%/C when the temperature increases. This yields a fall of the luminosity by 15% at the maximum temperature of environment.
	Luminous	
	The efficiency of the Magnetic Induction lamp does not largely depend on the temperature developed in the lamp. However, to be prepared for all eventualities, the SPS unit includes also a temperature control system.	The luminous efficiency of a LED increases with increasing temperature, which implies increase of the luminous flux. If, however, there is also an increase of the junction temperature this will lead not only to a decrease of the efficiency but also to the destruction of the LED. If we had a 30% reduction of the light intensity due to hardware failure, then the device should be removed because it could not meet the norms and standards of street lighting in luminance levels.
	Hours of operating	
	Due to the absence of electrodes, the passage of electric current does not spoil the crystal structure of the material. The Magnetic Induction lamp is considered as a product of innovative technology and its lifetime is **100,000** hours of operation, with basic characteristics of the device remaining at high levels throughout its lifetime.	The crystal structure of the semiconductor and its impurities for the creation of the LED diode can not endure the continuous passage of large currents in the material. As a result, the above structure is “damaged” after a relatively short time, which is about **30.000** hours of operation, under conditions of a constant driving current and at the levels of the environment temperature.

	Thermal conduction	
	No cooler is needed for removing the heat from the device.	The temperature of LED devices is their big problem, particularly for the temperature of P-N junction. Therefore, for the lighting devices which use several LEDs (to achieve high luminous power) it is obligatory to use appropriate coolers for heat removal.
	Effect of current fluctuations	
	They do not face a problem with fluctuations of the current. Besides the SPS system does not allow such problems.	They have a sensitivity to the fluctuations of current, which may lead to a change of destructions of LEDs.
	Spatialy Dispersion of light	
	The Magnetic Induction device does not employ lenses for the spatial dispersion of light at large angles. However, as a result of the structure of the lamp, the angle of dispersion is very large≥1200.	The major part of the emitted light energy is concentrated at ± 100 round the direction of maximum emission. Using special plastic lenses, we achieve spatial dispersion of light at larger angles, hence we attain a better visibility.
	Mechanisms of losses	
Principle of operation, Materials-Structure, Power Supply	a) We have not absorptions b) There are not refractive indices which define losses. c) There are not total reflections	a) Self-absorption b) There exist reflection losses when the light passes from the semiconductor to the air due to differences in the value of the refractive index. c) There is total reflection when the light propagates from the semiconductor to the air under an angle ≥critical angle. **d) A part of the light produced in the LED is back-reflected to the semiconductor in which it may be absorbed and transformed in additional heat. This is the ruling reason of inefficiency of LEDs.**
Energy saving	The illumination capacity, the optical damage, the luminous flux and the intensity of light are characteristics which excel in the Magnetic Induction (MI) devices. This fact involves a large saving of energy (≥30%) in MI devices compared to the LED ones. For the same optical power, the consumption of electric power is clearly smaller MI lamp.	The factor of heat (enemy of LEDs), the low power and the high optical damage do not allow to ensure the amounts of energy needed for equating the LED lamps with the Magnetic Induction lamps. For a given power, assumed to be the same for both devices, the consumption of electric power is larger for a LED lamp.
The Market	MI lamps can replace ALL the traditional old-technology lighting devices	Although, at this moment, LED devices can not worthily take the place of MI lighting devices, particularly in road constructions, they have been well received and rightfully found applications, specifically for lighting, in cases such as: TV screens, light signal boxes, road illumination systems, car lights, safety lights, indicators of instruments in medicine and industrial use, sensors, architectural lighting, etc.
Progress in the Development of Material	Research has started in 1990. Since 2000 a mass production and sale have occurred. Today MI lamp is considered in the market as the more innovative device in the domain of lighting.	1907--->Starting line of evolution 1960---> Beginning of decade: first LED as a combination of three diodes. 1970--->Production of green LED. 1990---> Middle of decade: a huge evolution 2000---> Onset of an unbridle evolution 2006---> Production of blue LED, opening of the way to the white light (prize of millennium technology)
Enonomical Factor	**With the mass production of Magnetic Induction lamps and peripherals, the cost will be decreased with reference to the old-technology lighting devices and will become a target from the market.** **The small consumption of electric power and the large lifetime (100,000 hours) compose a situation in which the saving of electric power, exceeding 70%, and the amortization in a relatively short time are factors that will be assessed and ventured in the market.**	For the time being, the high cost of LED production and the large cost of peripheral materials can not be accepted by the market for the of lighting devices in road construction. In all of the other applications the market responds positively.

Temperature	The temperature that is developed in the Magnetic Induction lamp is low and does not cause any problem to the device nor reduction of the luminous flux or the lamp's intensity.	Small dimensions of LED and large current flow within the semiconductor generate beyond energy into light and heat energy, this heat must be transferred rapidly to the environment because otherwise we would have hardware failure-destruction.
Technical Characteristics	**1. Nominal Lamp Power**	
	15Watt-400Watt	3Watt-100Watt
	2. Consumption of Electric Power [+Switching Power Supply] [SPS]	
	[+Switching Power Sypply,SPS]	[+Ballast Device]
	3. Hours of Operation	
	100.000	**35.000-50.000**
	4. For all the devices:	
	Dimming [sps+ lamp]	Dimming
	5. Power supply voltage	
	[SPS]:85V-265V	For driving Voltage or: 85V-265V
	6. Efficiency	
	≥85 Lumens/Watt	≥85 Lumens/Watt
	7.Color Rendering Index [CRI]	
	>85	>85
	8. Power Factor	
	>0,98	>0,98
	8'.Chromatic Temperature	
	2.500K-5.800K	2.500K-5.800K
	9. Maintainance of luminosity	
	Excellent maintainance of luminosity	Good luminosity at low temperatures
	10. Distortion	
	Low to zero Harmonic Distortion ~ 2%	Harmonic Distortion >2%
	11. Change of luminosity at low temperatures	
	Luminosity invariable at low temperatures	Good luminance at low temperatures
	12. Source of light	
	Source of diffused light, source of surface light. The light is not dazzling and does not flicker	Source of a concrete-spectrum light, with or without filters. The light beam has a characteristic directionality and provides a dazzling light. When an AC supply voltage is used, this light flickers at 50 Hz.
	13. Quality of light	
	It ensures an abundant and comfortable light which resembles too much the light of a sunshiny day.	It ensures a concentric and intense light over a very small lobe angle
	14. Decrease of CO_2	
	It contributes to the decrease of CO_2	It contributes to the decrease of CO_2
	15. Guarantee as regards the replacement cost	
	Zero replacement cost	No guarantee is possible
	16. Optical damage	
	This damage is extremely small if the materials (ICs etc) of the SPS unit have not been spoiled.	This damage is small provided that the crystal structure of the diode is not disturbed because of from fluctuations in the driving voltage current
	17. ON/OFF time	
	Good response	Very good response
	18. IP	
	IP 65	IP 65
	19. Temperature of operation	
	(-)35°C ~ (+)55°C	(-)20°C ~ (+)50°C
	20. Illumination angle	
	≥120°	Directional
	21.Warranty	
	6 years	3 years