

**LIGHT-EMITTING DIODE SOURCES OF LIGHTNING AS A SOURCE OF LOWERING COSTS OF SERVICE AND ENERGY CONSUMPTION OF TRAFFIC LIGHTS, HIGH LEVEL OF TRAFFIC MOVEMENT SAFETY**

**Normirzayev Abdukayum Rakhimberdiyevich\*, Eshanbabaev Abror Arslanovich, Majidova Gulnoza Nurmuhamedovna, Arslanov Jahongir Abror ugli, Tuxliyev Gayrat Axmadaliyevich,**

\*Republic of Uzbekistan, Namangan engineering-pedagogical Institute (NamEPI), 160812, The Republic of Uzbekistan, Namangan region, Uychi district, village Yarkurgan, Mahalla Yangichek, street A.Temur house 32, ph.: +998913624409, E-mail: nabducaum@mail.ru,

**Keywords:** light-emitting diode, traffic light, movement, devices, reliability, pedestrians, white, green, red, diameter, signal, effect, speed.

**Abstract:** Until recently in traffic lights ordinary glow lamps were used, but today on streets of the cities and railway routes the technological novelty – traffic lights light-emitting diode is strongly approved. Such replacement is caused them by their advantages. The applications of LED light sources for traffic lights regulating the movement – the major devices on automobile and railway routes. Clearness of signals, the increased reliability are guarantee of safety for equipment and people.

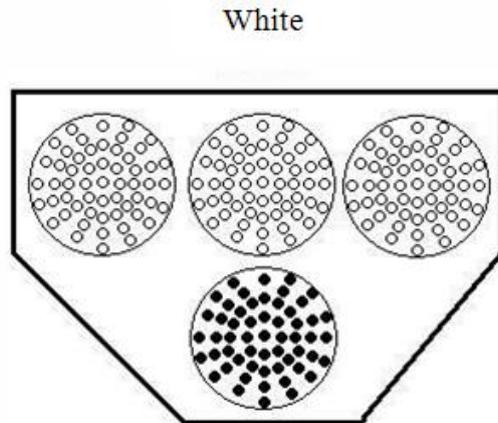
**INTRODUCNION**

Light – emitting diodes are visible enough under the bright sunlight as opposed to glow lamps and excludes erroneous visual effects (e.g. when what light of traffic lights is on). The speed of light-emitting diodes traffic lights activation is 0,00005-0,00007 seconds (when compared with the glow lamps it is about 0.2-0.3 seconds). High coefficients of color transfer, vibration resistance allows Light – emitting diode traffic lights to be placed on different conditional places [1].

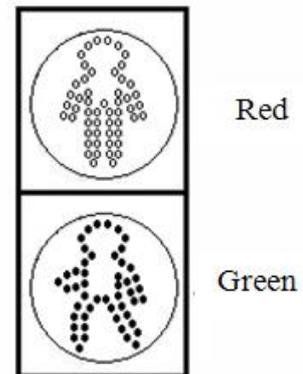
Transport, street and pedestrian Light – emitting diode traffic lights; blocks and radiators, supplementary sections, pedestrian thumbtacks, reversible traffic lights with the diameter of 100, 200 and 300millimeters, repeaters of traffic light signals, light – emitting diode traffic lights for trams, the panel of opposite time account, explosion – proof light – emitting diode traffic lights, sound signals, light – emitting diode traffic lights for internal signaling of industrial placements are produced in “СИЭ3 Navoi”.

**MATERIAL AND METHODS**

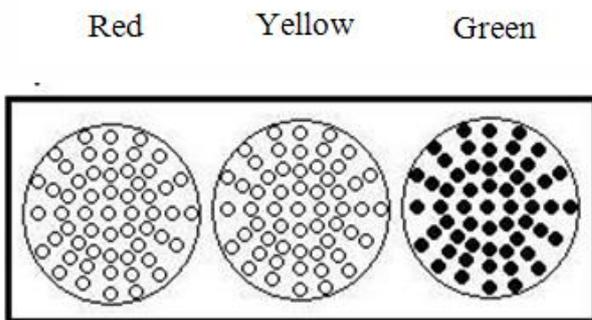
Traffic lights, movement regulators are important machinery for automobile and railways. Accuracy of signals are considered the means of security for technics and people



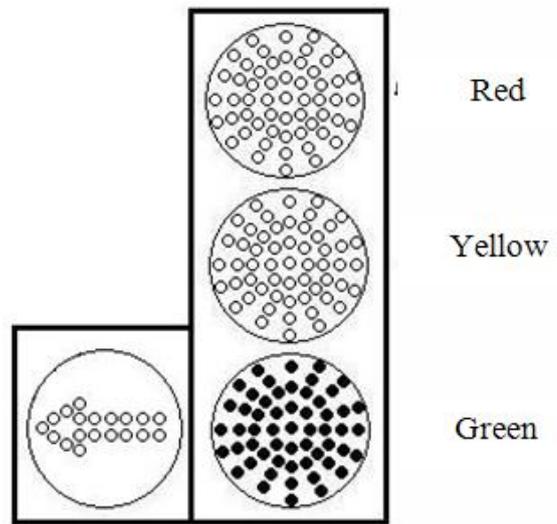
Light – emitting diode traffic light for trams T.5.1



Light – emitting diode traffic light for pedestrians



Light – emitting diode traffic light for automobiles with 3 sections



Traffic light with 3 sections accompanied with additional section (pointer)

The remaining types of light – emitting diode traffic lights

- One-color/two-color (red/green) digital panel of opposite time account
- Traffic light with explosion – proof light – emitting diode
- Traffic light with shaft light – emitting diode
- Light – emitting diode traffic light

- Blocks and emitters in our traffic lights “SID”, instead of glow lamps (super-bright light – emitting diodes)
- Traffic lights for road light-emitting diodes, with diameter 100 millimeter applied in case of repeaters of traffic light signals when their visibility is not high for drivers
- Three-digital light-emitting diode panels of opposite time accounts glows of traffic light signals
- Light – emitting panel of opposite time account
- Light-emitting diode pedestrian traffic light with panel of opposite time account
- Light-emitting diode pedestrian traffic light with panel of opposite time account and sound signal for blind and visually impaired people

Till now in traffic lights usual glow lamps have been used, but nowadays in the streets of cities and remaining roadways more solid technologically new light-emitting diode traffic lights are being maintained. These replacements have been carried out because of these following several reasons:

- These new traffic lights uses minimum electro energy;
- The sources of light allow more ordinal movements than traditional lamps;
- The possibility of rejection of light-emitting diode traffic lights is equal to zero;
- As light-emitting diode traffic lights do not own light filters, appearance of effects “all signals are switched on” (and this kind of false visual factors) are excluded because of sunlight reflections;
- The work of traffic lights with light-emitting diodes can not disturb vibration which is the result of roadway linens.

## RESULTS AND DISCUSSION

The result of implementation of light-emitting diode sources of lightning leads to the less expenditure on service and energy consumption of traffic lights, high level of traffic movement safety.

Advantages: Light-emitting diode traffic lights have clear bright light; they are less inclined to parasitic exposure. High “efficiency” economize electro energy. The withdrawal of light-emitting diode does not cause any trouble to the traffic light functions; these traffic lights does not burn, but loses its brightness year by year giving traffic servicemen the chance to renew. Light emitting diode traffic lights are visible from the high angles (this is advantage and at the same time disadvantage part of this machine). In one section several different signals may appear. They are more protective from vandalism.

Disadvantages: The skill of railway servicemen shows that yellow and white in these new traffic lights is taken as ineffective in case of sharp blinking. Because of an existence of large number of traffic lights, it is required that the traffic lights should be directed artificially by providing them with lens of Frenel. In the countries where significant cold winters are observed the traffic lights should be supplemented with the heating system which may be installed on the opposite back side of high “КПД”.

Light – emitting diode traffic lights for trams T.5.1 is for the regulation of tramways and usually installed on the plots where the visibility condition is limited, where slow lifting and lowering are existing and before the tram pointers.

The principal destination of tram’s traffic lights is to signal drivers of trams about the busyness of the next tramways after the traffic light. The activity of tram traffic lights is distributed only for trams.

Light-emitting diode traffic lights for trams have T-shaped form with “four-rounded signals of white-lunar lights”.

Top upper signals are used for the indication of allowed direction of movement (left, straight, right), and lower signals allows the start of movement [2].

Advantages compared with the glow lamped traffic lights

- High reliability (100000 hours);
- Lower usage of electro energy (6 Watt each section) - economization till 80% in comparison with glow lamps.

Technical parameters

- Supply voltage, 220 Walt, 50 Hz;
- Power consumption of each light, not more than 6 Watt;
- Date of service. 12 years;
- Diapason of working temperature °C from – 60 to +60;
- The strength of light – emitting diode source, candela: not less than 50;
- Diameter of lens, millimetre: 100;
- The light of glowing: white-lunar;

Recently, in Uzbekistan a new production company has started its business by producing traffic lights, projectors and light-emitting diode panels of advertisement.

The companies “Uzprommashimpeks” and “CFM Holding” (Singapour) has carried out exploitation works in the producer company “Navoi” which is now specialized in the production of light-emitting diode lamps and other lightning devices.

## CONCLUSIONS

The enterprise will yearly produce more than 2 million home light-emitting diode lamps, lamps for street lights, traffic lights, projectors and light-emitting panels for advertisement. The cost of the project is \$5 million from which \$ 3 million is invested by the Singapore Company.

In this enterprise 50 job positions have been developed, and when it reaches the full capacity it can employ 150 people.

It is worth noting that more than 50% of the products of “CFMProEnergies” is exported. In this year the enterprise is planning to produce about 30 000 lamps.

According to the specialists, the internal demand for lamps in the market of the country in 2011 is about 10.9 million items, and in 2015 it may reach 27.3 million items. Therefore, between 2011 and 2015 in Uzbekistan the production of different types of lamps rises by 4 times.

In the mid-1990s green light-emitting diodes with satisfactory brightness were invented and started to be used as an experiment in light-emitting diode traffic lights.

In Uzbekistan, Tashkent has been the first city where these types of traffic lights have been started widely to be used. In these days, in Namangan and many other cities light-emitting diode traffic lights are being implemented for the production of safety of movements on roadways.

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