

THE IMPACT OF NEON GAS IN THE MANUFACTURE OF LOW ENERGY SAVING LAMPS AND BILLBOARDS

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Abstract

Electric power must be good enough to be used because it can damage the equipment used in the economic industry. Electric power through light intensity plays a lot of role and still needs to be increased to produce more lighting products. To produce lighting products, it is necessary to conduct research by giving the code M (machine) and K (glass/tube), which will be replaced with K (glass), respectively. From the change in K, the light intensity was generated for further analysis. The results obtained show that if M5 from K5 starts to be replaced with K8, K11, K18, K23 it will result in a significant increase in electric current at the value of light intensity. The effect of fluorescent gas on lamps can be used with small electric currents to produce optimal light intensity (on Table 3, M5 and K23, M8 and K23, M11 and K23). With this research, it is expected that more optimal results with more lighting products with the intensity of light produced is optimal so that the price of the lamp is cheap. Fluorescent gas can be used in the manufacture of billboard lamps for the purpose of introducing industrial products.

Keywords: electric power, lights, light intensity

INTRODUCTION

Electricity (electric power) is the most important part of human life, as evidenced without electricity (electric power), human life begins to be disrupted. Electricity (electricity) is needed in daily life and electricity is absolutely necessary in the daily life of humans. Electricity (electricity) has entered almost every life and human civilization. Electricity (electricity) is needed for every level of importance, from basic things to bigger things. Finally electricity controls all conditions created by the community and without electricity activities cannot function properly. Electricity is now the main ingredient for the of life because electricity is used by people to live and support all interests.

Electricity lamps through light intensity in human life must be a tool that makes humans feel comfortable when using it [11]. Various supporting facilities have been made, but there are still many things that cannot be expected, such as lamps that waste electricity, causing fires and lamps that are easily damaged.

Electricity lamps must be developed based on functionality that must be adapted to the needs and abilities of humans as users [25]. There are many different facilities for lamps that have the same function for illumination and beauty. The lamp is also made according to its function and the lamp must function economically in its life [18]. There are many different facilities for lamps

that have the same function for illumination and beauty. Besides functioning as lighting, lights also have a function for beauty so that human life feels pleasant. This lamp has been streamlined with various energy saving lamps (Philips) and other types of LED lamps with various types of brands. Energy-saving lamps use fluorescent gas as a means to provide a flame to other parts so that the lamp can light up [16]. It is important to pay attention to the use of fluorescent gas (Neon Gas) to fill glass tubes, with light from lamps of various brands that have different lighting even though they have the same electric power (watts) due to the presence of electricity and fluorescent gas. The use of fluorescent gas must pay attention to the requirements that have been determined because it will have many effects on the eyes and health [13]. Lights that use fluorescent gas can be used to get comfortable work by installing gas fluorescent lamps without having to add lamps to the workplace [17]. Fluorescent lamps can disrupt the electrical power system by causing destructive sinusoidal waves [20, 24]. These disorders are very detrimental to eye health and possibly stressful [25]. Other disturbances caused by the installation of a neon-gas lamp can cause skin irritation in addition to irritating other bodies [3]. A major project underway to reduce greenhouse gas emissions is to save the earth from being destroyed by the use of excessive fluorescent gas lamps [4]. For the planning of the lighting system, there must be a planning that is good enough so that in the future the lighting system will become a lighting system with lights that are selected according to their function. The choice of lamp can be ensured with energy efficient lamps [6, 8]. The choice of lamps should use energy-efficient and long-lasting lamps [1]. Fluorescent gas is widely used as a filler for billboards and lamps for home lighting. The function of neon gas (neon) needs to be considered for the development of its use through research. Neon gas (neon) is a very light gas after helium. Because it is lighter than other gases after helium, fluorescent gas (neon) is widely used as a means of lighting (typically fluorescent gas). Fluorescent gas can be used for many types of lamps without quality or without warranty. The manufacture of gas fluorescent lamps causes many problems to the power grid and its users [3]. Fluorescent gas can be used as industrial product introduction advertisements installed in strategic places. Fluorescent gas is formed in such a way and with the combination of these colors, the fluorescent gas is very attractive to be used in the design of the required lamps. The function of neon gas is to give a reddish white color and reduce heat in the lamp. The use of neon gas also serves as an important tool in the industrial world. Fluorescent gas is can formed in such a way and with the combination of these colors, fluorescent gas is very attractive to be used in designing the required lamps. Currently, billboards that use fluorescent gas lamps are widely produced to introduce industrial products that are installed on strategic roadside [5]. The selection of billboards for industrial use is much cheaper than television. Billboard selection is the choice of most industrial products to be introduced [14].

Fluorescent gas was analyzed to determine the effect of neon gas on light intensity, and the ability of neon gas and its function in the design to introduce industrial products with billboards [14, 19].

1.1 Research Objectives

1. To find out the extent of the influence of neon gas on the intensity of the emitted light.
2. To determine the change in light intensity with the difference in the neon gas used.
3. To determine the function of neon gas in the development of other lamps with the intensity of the light produced.
4. To find out the change in electric current in energy saving lamps with different glass tubes (K).
5. To find out the development of billboards with non-gas lamps for industrial purposes.
6. To determine the efficiency of light intensity on changes in neon gas.

1.2 Research Benefits

1. Fluorescent gas is expected to be used for smaller electric power sources in larger glass tubes.
2. Fluorescent gas is expected through this research to be able to introduce the nature of fluorescent gas as a gas that is able to provide a large enough light intensity for good lighting.

1. MATERIALS AND METHODS

2.1 Material

2.1.1 The Lighting

Lighting or so-called light intensity is very important and needs attention because it is in direct contact with humans. The intensity of light is needed when humans perform activities at night. During the day it is also not uncommon to use lights because they have not used sunlight in the design of space. Ultra Violet radiation from neon lights can cause eye strain, migraines, and dizziness. But the effect can be reduced by placing neon lights at least 1 to 2 feet. Especially if working under the light for hours will make the body become stressed and cause health problems, such as sleep disorders, cancer and migraines. Light sensitivity can also cause headaches because of its brightness [10].

2.1.2 Health Problems

Physical symptoms due to fluorescent lights can develop over several minutes of exposure. These symptoms include eye pain, inflammation of the eye or pain, difficulty reading and focusing, blurred vision or visual disturbances, headaches, dizziness, nausea, shortness of breath, depressed mood in sleep disorders [15]. Neon is a chemical element in the periodic tables that have the symbol Ne and atomic number 10. Neon is included in the noble gas group which is colorless and inert. This fluorescent gas gives a distinctive reddish light when used in vacuum tubes and fluorescent lamps. In this life, we can hardly escape from light. The lamp is considered a basic requirement. However, users often do not understand that the lights they have do not yet support the Go Green concept [12]. Anger can have a bad impact on children, namely to reduce IQ and IQ decline, of course, greatly affects old age. Neon gas is a chemical substance and is included in the periodic table with the symbol Ne and has an atomic number that belongs to the group of colorless noble gases. Fluorescent gas if inhaled can cause shortness of breath if there is not enough oxygen to breathe.

2.1.3 Characteristics

Fluorescent gas provides reddish light when used in vacuum tubes and used in fluorescent lamps. The nature of this neon gas makes it widely used as a material for making signs. Environmentally friendly fluorescent gases can emit ionized light and can pass through smog. Fluorescent gas is lighter than air which is a monatomic gas which is mostly made of nitrogen (N2). Neon gas can fill air balloons so that air balloons can rise into the air. Non density is 0.9 * 10-3 g / cm3 at 200 C with melting point -2490 C and boiling point -2490 C. This condition allows neon gas to be used in various forms and can be processed as desired and neon as a liquid or gas, relatively more expensive - for small amounts. The price of liquid fluorescent gas can be more than 55 times that of liquid helium.

2.1.4 Benefits of neon gas.

In addition to lighting, fluorescent gas is widely used for lazer-neon, vacuum tubes, lightning rods, high voltage indicators and billboards. Another use of neon is that neon gas is 40 times more effective as a refrigerator than liquid helium and 3 times better than liquid hydrogen because of its high cooling capacity [29]. Fluorescent gas (liquid), which is a liquid that can be used in cryonic to freeze corpses. The use of fluorescent gas for a long period of time can reduce the life of the lamp and reduce the light intensity due to heat from the lamp [1].

2.1.5 Lighting formula

In the installation or design must meet the requirements and criteria for existing room conditions. It is hoped that the lamp will not often cause problems and the lamp can help provide optimal lighting. The theory of electricity can provide direction to recognize the lights needed [28]:

$$\Phi = E \times A \text{ (lumen) (1)}$$

Where:

- E is the light intensity (lux)
- A is the area of work area (m²)
- ∅ is light fluctuation (lumens)

No less important is the armature that can make lighting emit better light intensity. Armature efficiency must also be known because it will determine the amount of light emitted depending on the material and shape of the armature [16]. Armature gives focus to light intensity.

$$v = \frac{\text{fluk of light emitted by the armature (light fittings)}}{\text{fluk of light emitted by light source}} \text{ (2)}$$

In this research we will use PHILIPS brand lamps in the market. Philips lamps are lamps that have good standards and quality. The PHILIPS lamp used is an essential type of lamp with energy saving conditions and has no heat properties. The PHILIPS lamp used is with a capacity of 5 watts, 8 watts, 11 watts, 18 watts, and 23 watts.

2.1.6 The use of electronic materials in energy saving lamps [9]

a. Capacitors

The general function of a capacitor is as a store of electrical current to balance the circuit conditions. Capacitors can provide electricity in case of an electric current imbalance.

b. Resistance (ohms)

Resistance functions as a barrier to the electric current that passes through the circuit so that there is no excess electricity.

c. Diode

The diode functions as a rectifier for the passing electric current. The diode directs an electric current that flows from AC to DC [7].

d. Transistor

The transistor functions as an amplifier, controller, rectifier, oscillator and modulator. In lamps, the transistor functions as an electrical amplifier that passes through.

e. Inductor

Inductor is a coil of wire that functions as energy storage in a magnetic field caused by an electric current.

f. Transformer

The transformer serves as the main line for the entry of electric power. Transformers have the property of raising and lowering the voltage. In energy saving lamps, the transformer functions as a voltage reducer so that it can be used in a series of lamps.

Nowadays electronic materials become the basis for producing energy saving lamps with all the benefits of electronic materials making the light industry world develop very rapidly. The development of the electronic world affects other fields that make it alive and utilizes electronic developments to develop. Today the world is full of electronic materials, so everything is electronic. The development of the electronic world affects other fields that make it alive and utilizes electronic developments to develop. Today the world is full of electronic materials, so everything is electronic. Utilizing electronic materials can simplify life and make human life more comfortable [2].

The function of electronic materials is very important because the nature and characteristics of electronic devices can function as needed. The electronic devices needed must be able to work in accordance with the functions and tasks. Energy-saving lamps require electronic devices to adjust the incoming electrical power to provide electrical power input so that the energy-saving lamp can light properly. Energy saving lamps consist of 2 (two) parts according to their function, one as an engine (M) and as a tube in which there is a neon gas (K). These two parts have different functions, namely as an energy supplier (M) and which has the property of giving light

is a tube (K). The circuit on the engine (M) is a closed circuit that provides electricity to the tube (K).

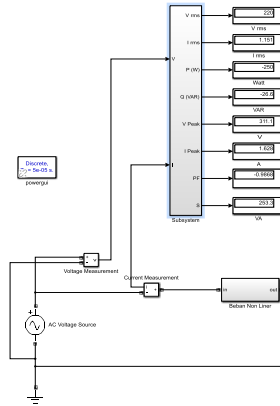


Figure 1. Energy Saving Light Image [26].

2.2 Method

The method in this discussion is by direct measurement of the lamp with different conditions on the lamp to obtain lamp light intensity data. The data obtained is primary data which will later be used as material to be processed as needed. The measured light intensity data were collected for analysis in making:

1. Table of relationship between various conditions between lamps and changes in Machinery and Glass.
 2. The percentage of decrease and increase in the use of neon gas.
 3. Increase and decrease in electric current due to changes made between the Machine and Glass on the lamp.
 4. The analysis is carried out to get the effect of the quality of the power used.
- Further analysis is carried out with the help of software.

3 HOW TO DO RESEARCH

Research carried out by:

1. Prepare a research tool
2. Install research tools
3. Conduct research by installing lights and replacing them alternately until completion
4. Take data by measuring all light conditions to get light intensity with a lux meter (SANWA: LX.3131)
5. Electric current data retrieval on the lamp using a digital clamp meter (KEW2117R)
6. Record the results of research
7. Analysis

4. RESULTS AND ANALYSIS

4.1 Research Results

4.1.1 The results of the study were obtained from measuring the number of M (machines according to the magnitude in watts) and K (tubes).

Table 1. Light Intensity Measurement Results (Lux) [26].

| | K5 (watts) | K8 (watts) | K11 (watts) | K18 (watts) | K23 (watts) |
|-------------|---------------|---------------|----------------|----------------|----------------|
| M5 (watts) | 50 | 75 | 85 | 120 | 145 |
| M8 (watts) | 70 | 95 | 115 | 140 | 150 |
| M11 (watts) | 80 | 85 | 110 | 195 | 205 |
| M18 (watts) | 115 | 135 | 145 | 200 | 225 |
| M23 (watts) | 120 | 185 | 195 | 240 | 250 |

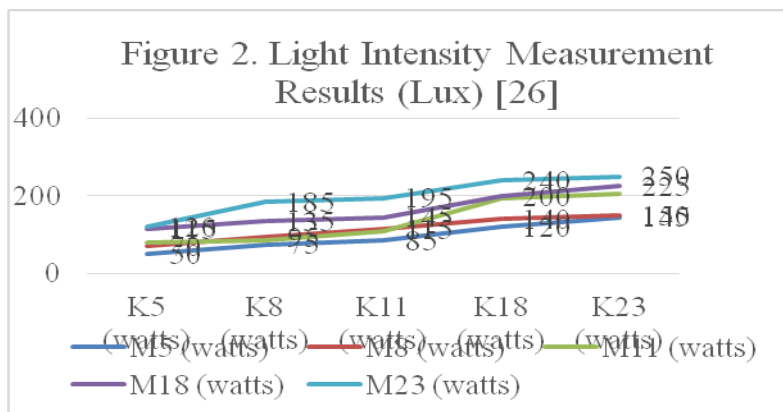
Information:

M = Engine

K = Glass with neon gas

The terms M and K mean that M is a lamp machine which is then replaced by K (glass) containing neon gas according to the wishes of the researcher. The results of this study were carried out by replacing glass containing neon gas to obtain data values with lux measurements. The intensity of the light obtained is done on one machine with various kinds of glass being measured. In Table 1, the results of the light intensity of each machine with glass with different amounts of fluorescent gas are obtained. Looking at Table 1. and in Figure 2. in general it can be seen that there is an increase in neon gas that can provide periodic increases in light intensity.

Viewing pictures 1. In general it can be seen that there is an increase in the intensity of light periodically in conditions where there is an increase in the use of neon gas.



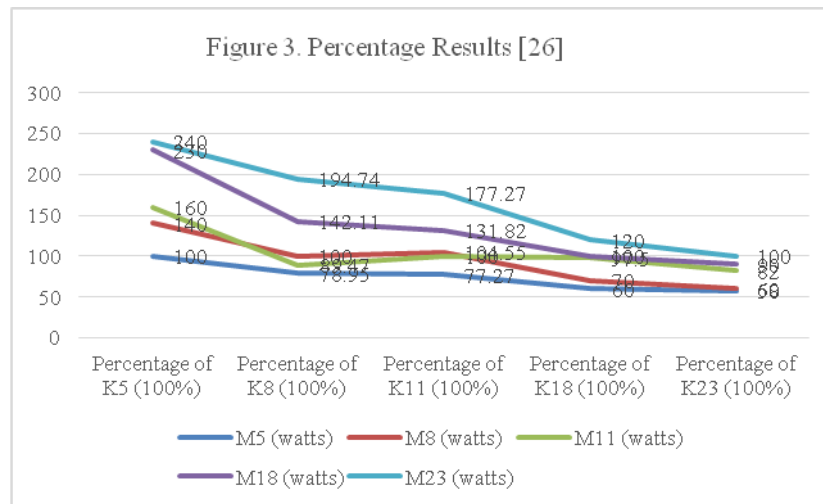
4.1.2 Percentage of Research Results

The percentage of the results of the study was intentionally sought to obtain the difference from each measurement in terms of the value of the magnitude of M and the conditions of the magnitude of K that were different. Large values that are different, M and K will be used as a model in determining appropriate research conditions, so that the results of the study will be seen the difference.

Table 2. Percentage of Results of Research Analysis (100%) [26].

| | Percentage of K5 | Percentage of K8 | Percentage of K11 | Percentage of K18 | Percentage of K23 |
|-------------|------------------|------------------|-------------------|-------------------|-------------------|
| M5 (watts) | 100.00 | 78.95 | 77.27 | 60.00 | 58.00 |
| M8 (watts) | 140.00 | 100.00 | 104.55 | 70.00 | 60.00 |
| M11 (watts) | 160.00 | 89.47 | 100.00 | 97.50 | 82.00 |
| M18 (watts) | 230.00 | 142.11 | 131.82 | 100.00 | 90.00 |
| M23 (watts) | 240.00 | 194.74 | 177.27 | 120.00 | 100.00 |

Looking at Figure 3. which shows the percentage, it appears that the percentage results indicate a decrease in the value of the percentage.



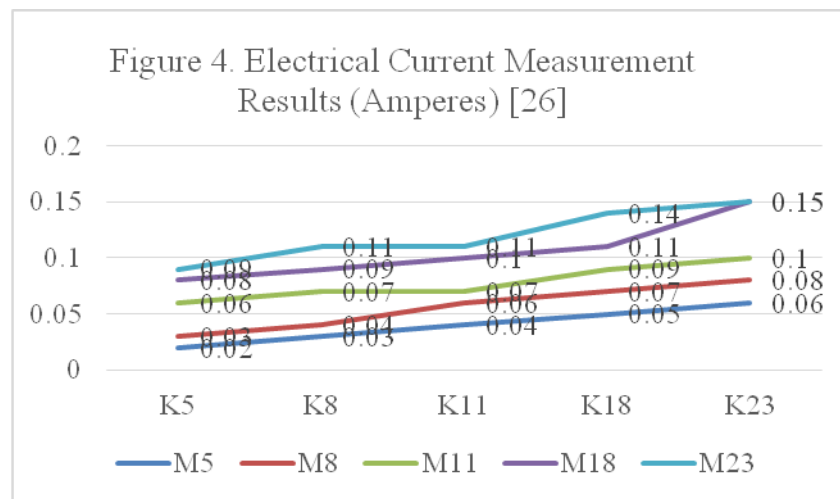
4.1.3 Electrical current measurement results

The measurement results table is used to find the amount of current in each condition when the engine (M) is installed in a tube (K) containing different fluorescent gases.

Table 3. Electrical Current Measurement Results (Amperes) [26].

| | K5 | K8 | K11 | K18 | K23 |
|-----|-------------|-------------|-------------|-------------|-------------|
| M5 | 0.02 | 0.03 | 0.04 | 0.05 | 0.06 |
| M8 | 0.03 | 0.04 | 0.06 | 0.07 | 0.08 |
| M11 | 0.06 | 0.07 | 0.07 | 0.09 | 0.10 |
| M18 | 0.08 | 0.09 | 0.10 | 0.11 | 0.15 |
| M23 | 0.09 | 0.11 | 0.11 | 0.14 | 0.15 |

Figure 4. Shows that the results of the electric current measurement show there is an increase in current in each condition. The results in Figure 4. It is needed to know the level of addition of the current that occurs.



4.2 Analysis Results

4.2.1 Effect of neon gas on light intensity (lux)

The results of the study in Table 1. sees produced a large value of light intensity with a significant increase. The magnitude of the results of research has shown that neon gas can be used in the smallest electric currents, even though more neon gas (because it has a low melting and boiling point). In Table 1. in M5, even though K (the tube) is switched from K5 to K23, the light is still on, this proves that fluorescent gas is suitable for small electric capacity. If seen in Figure 1. there is an increase in the intensity of the light which, although exchanged to a fairly high level. This shows fluorescent gas can be used for energy saving lamps [27]. In Table 1 it can be seen that the results of the M8 study were installed on K5, M11, M18 to M23, which means that they still experienced a fairly bright flame. M11, M18 and M23 also experienced the same thing as M8 and the results were also the same, which happened bright enough lights. So

that fluorescent gas (neon) is suitable for making billboards that require a small electric current with well-lit lighting [22]. The use of fluorescent gas is currently being developed in the manufacture of household lamps with high light levels and low electric currents. Because of the features and characteristics of fluorescent gases, development is underway to get energy efficient lighting. Nowadays energy saving lamps can be accepted by the public as lamps that are suitable for use because electricity is getting more expensive. Energy-saving lamps have been widely used and the benefits have been felt by users, but what about the effect of the electrical power that is needed. It is necessary to think about how to maintain the quality of electrical power when using energy-saving lamps [9].

Reasons for using energy saving lamps.

1. Save costs and electricity bills per month, the intensity of the light emitted is brighter than the electricity used.
2. Save monthly expenses, seen from the use of lights, because there is no need to have to buy a bulb every month.
3. The color is whiter, good lights are white which is almost the same as sunlight so that at night you can see colors more clearly.
4. The movement, which is called Go Green, means that the use of energy-saving lamps does not often buy lamps by reducing lamp production so the factory reduces its production. With a little factory production, factory smoke can be reduced.

Other things that inhibit the use of fluorescent gas in energy-saving lamps such as health effects on humans. To reduce health effects on humans is to place lights as far as 1 to 2 feet from where we are [21].

4.2.2 Changes in lamp light intensity with differences in fluorescent gases.

The results of the study in Table 1. these are the results of data that can show that fluorescent gas can be used for the smallest source of electricity as needed. By providing fluorescent (neon) gas a different electric power can still continue the light from the burning wire to be transmitted to the entire vacuum tube. It is proven that electric power from M5 can still provide the intensity of light in the vacuum tube on K23. For M23 to K5, the power will turn on but it is still in critical condition (the light is red enough, the K5 lamp will go out). While for M8, M11, M18, and M23 paired with different K, there is no problem.

In Table 2. shows there is a change in the intensity of the light emitted at each K (glass tube). Although given different electric power, but K still lights up even though the intensity of the light emitted is somewhat reduced. If seen from Figure 2. can be clearly seen a decrease in the level of light intensity emitted from each K (glass). In Table 2. it can be seen more clearly the percentage decrease in light intensity which is a condition of fluorescent gas (neon) in connection with its use as a lighting device that is good enough to be used as lighting or as decoration, because neon gas has a white color and can even be colored as desired. The level of the percentage of lighting intensity shows a decrease in the overall efficiency of energy-saving lamps, which means it is related to the quality of the lamps based on differences in the filling of

fluorescent gas in the glass tube (K). Fluorescent gas greatly contributes that neon gas provides cooling to the heat that occurs due to heating due to the filament's flame.

4.2.3 The use of neon gas in relation to the development of other lamps with the intensity of the light produced

It is important to conduct research on the relationship between neon gas and light intensity. It is important to make changes so that there are energy-saving lamps at lower prices. The existence of energy saving lamps other than the Philips brand shows that the use of neon gas can be used properly. Judging from the results of measurements obtained that the lights of other brands have light intensity far below the light intensity of the PHILIPS brand. The light intensity of other brands with 7 watts of electricity has a light intensity of 37.5 lux, and with 18 watts of electricity has a light intensity of 75 watts. If two lamps from this other brand are crossed (exchanged for glasses containing fluorescent gas) then M7 with K18 produces a light intensity of 50 lux and if M18 with K7 produces a light intensity of 62.5 lux. So the light intensity of other brand lights has a light intensity far below the PHILIPS brand lights.

The conclusion that can be drawn is that art and creativity can produce new products. New products have emerged using neon gas as a commodity to produce new economic products.

4.2.4 Changes in electric current

In Table 3. shows the current changes that occur in the condition of the engine (M) with changes in the tube containing neon gas (K) used. This change is in accordance with changes in the fluorescent gas tubes used ^[10]. This change shows that there is a change in the intensity of light that occurs followed by changes in the use of electric current. The greater the intensity of the light that occurs also requires greater changes in electric current. The conclusion that can be drawn is that making lamps that use fluorescent gas must be adjusted to the level of electric current used (in Table 1. and Table 3. can be compared). This means that it is related to the engine (M) which will be designed according to the needs of the neon gas on the glass (the tube containing neon gas) which will be made according to the needs. For the manufacture of billboards using neon gas designs must pay attention to the design of the engine (M) in adjusting the tubes used so that the lights can be lit according to the design. This means that an increase in the use of neon gas shows an increase in the electric current used. If designing lamps using of the fluorescent gas must use an electric current design that is adapted to the use of neon gas. Neon gas (Table 1.) shows that in the electric current M5 with Glass K8, K11, K18, K23 that the lamp can still burn with the resulting light intensity increasing significantly. M8, M11, M18, M23 under the same conditions the lamp can function properly except on M23 and K5 the flame is not good. Neon gas can be interpreted and can be used in lamps with small electric currents with limitations.

4.2.5 Manufacture of billboards with neon-gas lamps for industrial use.

Billboards are a tool used as a tool for the purpose of introducing industry results. The results of industry produced must be known by the general public that a certain product has been produced for certain needs as well. Seeing from the present condition the results of industry produced

from factories are very numerous and varied. So the rapid expenditure of industrial products produced is very necessary to make alternative choices for introducing industry results to be selected and known by the public. This alternative is needed because introducing industrial results via television is very expensive. Through billboards introducing industry results can be minimized again through the use of electric current used (Table 3). See Table 3. Utilization of electric current by using fluorescent gas can be done to a certain extent in accordance with the design of the electronic equipment used. The electronic equipment used must be based on calculations to be able to pass the required electric current. In accordance with the measurement results obtained (Table 3.), it is very necessary provisions in the table to apply to the design of billboard lights to be made. See Table 3. it is certain that the manufacture of lamps with neon gas can be made minimally by minimizing electric current. Making of lights on the billboards plus an automatic tool to turn on and turn off automatically at certain hours. The making of billboards is based on the desire of the producers to change the behavior of consumers to own goods after going through the billboard process [5]. The application in Table 1. is the basis that must be known in making or designing lamps to be installed on billboards, so that the lights that are installed can be useful as saving lamps in energy use.

4.2.6 Efficient light intensity on changes in fluorescent gas

From the efficiency of the light intensity obtained, it can be interpreted that any addition or increase in the use of neon gas will also be adjusted to the use of the electric current used. The making of billboards must be based on Table 2. that can predict the minimum value of the use of electronic current. Making an electric current source by assembling an electronic device must calculate the electronic device used to be able to flow out the electronic device, which can be used to make fluorescent gas ignite. So every addition of neon gas can certainly increase the electric current periodically. The use of electric current can be reduced according to the benefits and functions of the billboards made (Table 1.). Although the use of neon gas is related to electric current, in making billboards the use of electric current can be reduced because billboards don't have to have optimal intensity. The use of fluorescent gas lamps in the manufacture of billboards to use more neon gas and reduce electric current even efficiency can certainly be reduced. The purpose of the search for efficiency is to get the usage limit of the use of electric current and neon gas to get the minimum value of the analysis between the use of electric current and neon gas [23]. The use and utilization of lamps have been regulated as well as their relationship to power quality based on the general rules of electrical installation [17]. The efficiency of using neon gas really needs to pay attention to the requirements of the results of research on the use of electric currents to be used so that the quality of energy-saving lamps is better (Table 2). To determine the condition of the efficiency of light intensity on changes in neon gas, which is in Table 2. which shows that the efficiency of using neon gas will decrease in conditions M5 with K8, K11, K18, K23. The results of this study indicate a decrease in efficiency, which means a decrease in the quality of the lamps but the conditions are still in a condition that the energy saving lamps can light up properly. The design of energy-saving lamps must take into account the conditions of using fluorescent gas and the electric current used.

4.3 Updates from Research

The research is expected to make a platform for the development of general lighting that can use fluorescent gas as a base material to make lamps that aim to make other types of lamps as well as the development of energy saving lamps. Fluorescent gas as a base material can still be developed in connection with the manufacture of different billboards and energy saving lamps after seeing the results of this study. Neon gas, which is lighter than most gases, is suitable for use as a material for making energy-efficient tube lamps. The use of fluorescent gas is possible to be developed in the manufacture of energy-efficient lighting products and the manufacture of other products such as billboards.

5. CONCLUSION

Conclusions that can be conveyed from the discussion of this study:

From the research and discussion results, it is known that the effect of neon gas on light intensity results in significant changes in light intensity. If you look for the effect of fluorescent gas on light intensity, it can be concluded that it produces and shows that fluorescent gas can be used at the smallest source of electric current as needed. By providing an electric current that is different from the smaller electric current on the Glass (K) through the Machine (M), the fluorescent gas can still continue the intensity of light from the burning wire to be distributed throughout the vacuum tube. Fluorescent gas lamps with energy-saving lamp designs are needed by the public because electricity is getting more and more expensive. Energy-saving lamps also cause disturbances in electricity, so it is necessary to overcome electrical disturbances in the use of energy-saving lamps. There has now been an interesting development of energy saving lamps and many other brands made using fluorescent gas. Through this research, it is hoped that more and more lamp models will be produced as energy efficient lamps to enliven the economic market. The manufacture of billboards with energy-efficient lighting designs is currently also very developed to introduce industrial results to the community. Billboard design really needs the support of researchers from electricians in order to use energy-efficient electricity. It is confirmed that of the neon gas will develop rapidly in its use as energy-saving lamps and billboards that will dominate the economic market.

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