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EXPERIMENTAL STUDY OF RTV SILICONE RUBBER INSULATOR OPERATED ON VARIOUS TEMPERATURE

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ABSTRACT
This paper has various type of approach for stable point of insulator which are used in high voltage transmission line. By experimental approach we can be decides that best coating material for insulator with the help of temperature parameter. the commercial coating material are five types such as Natural Silk , Laminated wood , Wire enamels based on Polyvinyl formal , RTV Silicone Rubber , Silicon-Alkyd Insulation Materials with Initial Temperature are 30°C. To make porcelain, the raw materials such as clay and silica are first crushed using jaw crushers, hammer mills, and ball mills. By experimental process we are decided the best coating material for insulator as RTV Silicone Rubber.

KEY WORD- RTV, silicone rubber, end-of-life, insulator coatings

INTRODUCTION
The primary components of porcelain are clays, feldspar or flint, and silica, all characterized by small particle size. To create different types of porcelain, craftspeople combine these raw materials in varying proportions until they obtain the desired green (unfired) and fired properties.

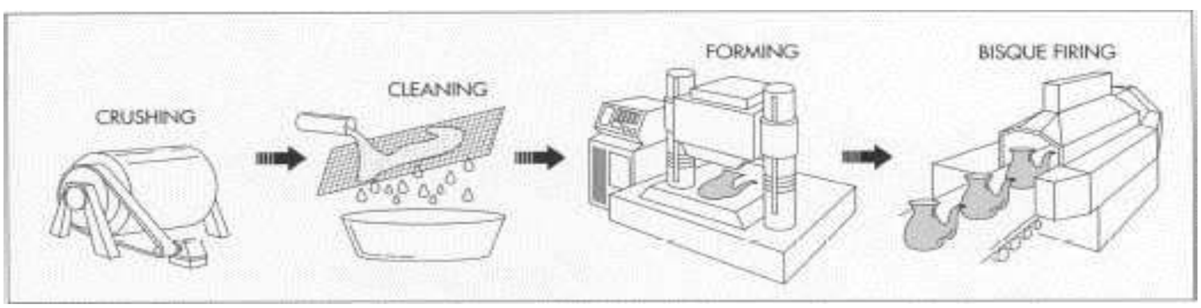

Figure 1.make porcelain

Silica is a compound of oxygen and silicon, the two most abundant elements in the earth's crust. Its resemblance to glass is visible in quartz (its crystalline form), opal (its amorphous form), and sand (its impure form). Silica is the most common filler used to facilitate forming and firing of the body, as well as to improve the properties of the finished product. Porcelain may also contain alumina, a compound of aluminum and oxygen, or low-alkali containing bodies, such as steatite, better known as soapstone.

THE MANUFACTURING PROCESS
After the raw materials are selected and the desired amounts weighed, they go through a series of preparation steps. First, they are crushed and purified. Next, they are mixed together before being subjected to one of four forming processes soft plastic forming, stiff plastic forming, pressing, or casting; the choice depends upon the type of ware being produced. After the porcelain has been formed, it is subjected to a final purification process, bisque-firing, before being glazed. Glaze is a layer of decorative glass applied to and fired onto a ceramic body. The final manufacturing phase is firing, a heating step that takes place in a type of oven called a kiln.

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Crushing the raw materials

First, the raw material particles are reduced to the desired size, which involves using a variety of equipment during several crushing and grinding steps. Primary crushing is done in jaw crushers which use swinging metal jaws. Secondary crushing reduces particles to 0.1 inch (.25 centimeter) or less in diameter by using mullers (steel-tired wheels) or hammer mills, rapidly moving steel hammers. For fine grinding, craftspeople use ball mills that consist of large rotating cylinders partially filled with steel or ceramic grinding media of spherical shape.

Cleaning and mixing

The ingredients are passed through a series of screens to remove any under- or over-sized materials. Screens, usually operated in a sloped position, are vibrated mechanically or electromechanically to improve flow. If the body is to be formed wet, the ingredients are then combined with water to produce the desired consistency. Magnetic filtration is then used to remove iron from the slurries, as these watery mixtures of insoluble material are called.

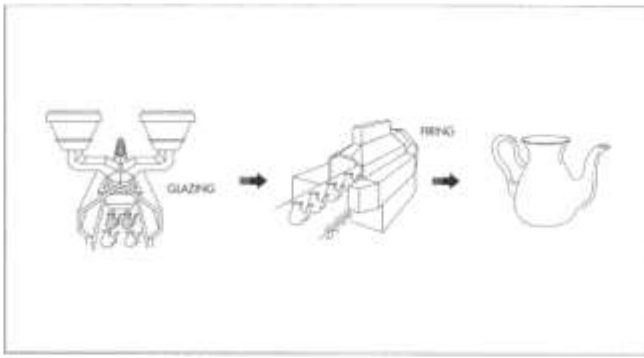

Figure 2. Glazing

After bisque firing, the porcelain wares are put through a glazing operation, which applies the proper coating. The glaze can be applied by painting, dipping, pouring, or spraying. Finally, the ware undergoes a firing step in an oven or kiln. After cooling, the porcelain ware is complete. an undesirable reddish hue to the body if it oxidizes, removing it prior to firing is essential. If the body is to be formed dry, shell mixers, ribbon mixers, or intensive mixers are typically used.

Forming the body

Soft plastic forming, where the clay is shaped by manual molding, wheel throwing, jiggering, or ram pressing. In wheel throwing, a potter places the desired amount of body on a wheel and shapes it while the wheel turns. In jiggering, the clay is put on a horizontal plaster mold of the desired shape; that mold shapes one side of the clay, while a heated die is brought down from above to shape the other side. In ram pressing, the clay is put between two plaster molds, which shape it while forcing the water out. The mold is then separated by applying vacuum to the upper half of the mold and pressure to the lower half of the mold. Pressure is then applied to the upper half to free the formed body.Stiff plastic forming, which is used to shape less plastic bodies. The body is forced through a steel die to produce a column of uniform girth. This is either cut into the desired length or used as a blank for other forming operations.Pressing, which is used to compact and shape dry bodies in a rigid die or flexible mold. There are several types of pressing, based on the direction of pressure. Uniaxial pressing describes the process of applying pressure from only one direction, whereas isostatic pressing entails applying pressure equally from all sides.
slip casting, in which a slurry is poured into a porous mold. The liquid is filtered out through the mold, leaving a layer of solid porcelain body. Water continues to drain out of the cast layer, until the layer becomes rigid and can be removed from the mold. If the excess fluid is not drained from the mold and the entire material is allowed to solidify, the process is known as solid casting.

Bisque-firing

After being formed, the porcelain parts are generally bisque-fired, which entails heating them at a relatively low temperature to vaporize volatile contaminants and minimize shrinkage during firing.

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Glazing

After the raw materials for the glaze have been ground they are mixed with water. Like the body slurry, the glaze slurry is screened and passed through magnetic filters to remove contaminants. It is then applied to the ware by means of painting, pouring, dipping, or spraying. Different types of glazes can be produced by varying the proportions of the constituent ingredients, such as alumina, silica, and calcia. For example, increasing the alumina and decreasing the silica produces a matte glaze.

Firing

Firing is a further heating step that can be done in one of two types of oven, or kiln. A periodic kiln consists of a single, refractory-lined, sealed chamber with burner ports and flues (or electric heating elements). It can fire only one batch of ware at a time, but it is more flexible since the firing cycle can be adjusted for each product. A tunnel kiln is a refractory chamber several hundred feet or more in length. It maintains certain temperature zones continuously, with the ware being pushed from one zone to another. Typically, the ware will enter a preheating zone and move through a central firing zone before leaving the kiln via a cooling zone. This type of kiln is usually more economical and energy efficient than a periodic kiln.

FEATURES OF RTV SILICONE RUBBER

1. Good characteristics of easy-operation
2. Light viscosity and good flowability
3. Low shrinkage
4. Favorable tension
5. No deformation
6. Favorable hardness
7. High temperature resistance, acid and alkali-resistance and ageing resistance

PROPERTIES OF RTV SILICONE RUBBER

Silicones exhibit many useful characteristics, including:

- Low thermal conductivity
- Low chemical reactivity
- Low toxicity
- Thermal stability (constancy of properties over a wide temperature range of −100 to 250 °C).

TESTING PROCESS USING VARIOUS INSULATION MATERIALS

Figure 3. Testing of Temperature on insulator

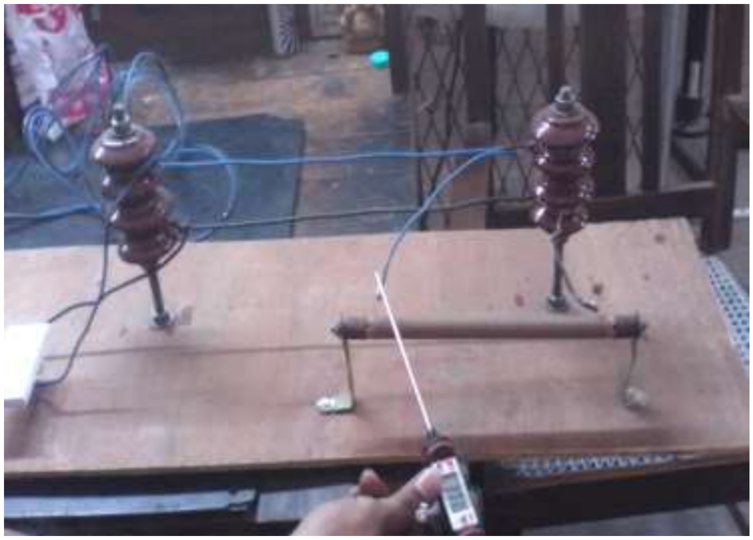

Figure 4. Testing of Temperature on contact point of terminal with 1000 Watts load

Table.1. Temperature using of Natural Silk Insulation Materials and Initial Temperature are 30°C

Sr. No.	Time in minutes	Temperature (°C) of Insulator on Final stage
1	2	40
2	4	48
3	6	55
4	8	64
5	10	77

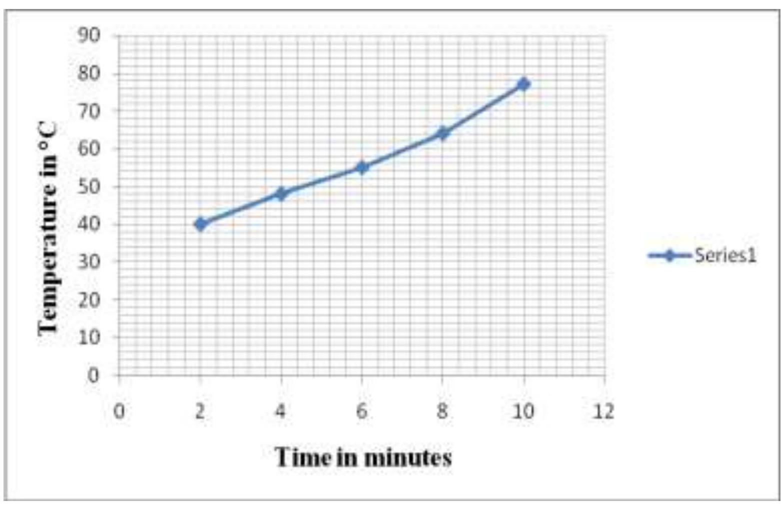

Figure 5. Temperature using of Natural Silk Insulation Materials and Initial Temperature are 30°C

Table.2. Temperature using of laminated wood Insulation Materials and Initial Temperature are 30°C

Sr. No.	Time in minutes	Temperature (°C) of Insulator on Final stage
1	2	44
2	4	52
3	6	62
4	8	68
5	10	82

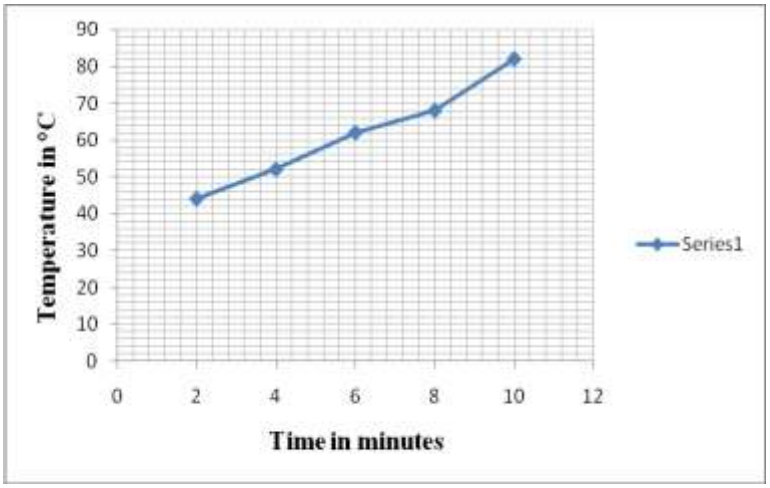

Figure 6. Temperature using of laminated wood Insulation Materials and Initial Temperature are 30°C

Table.3. Temperature using of Wire enamels based on Polyvinyl formal Insulation Materials and Initial Temperature are 30°C

Sr. No.	Time in minutes	Temperature (°C) of Insulator on Final stage
1	2	46
2	4	54
3	6	63
4	8	77
5	10	87

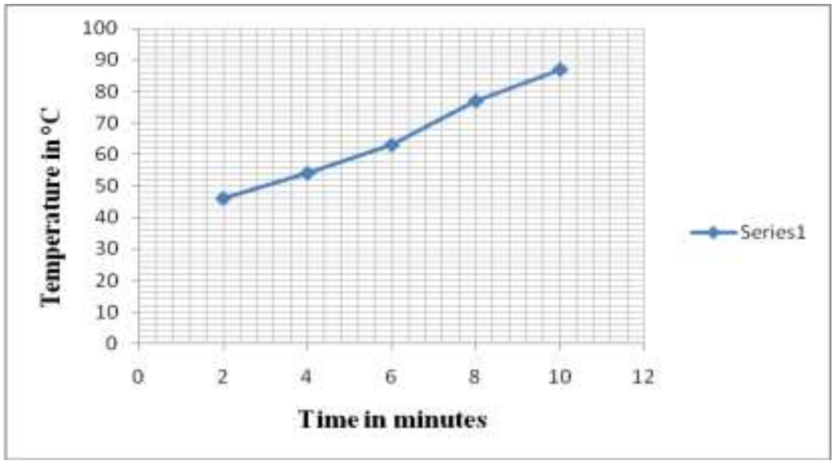

Figure 7. Temperature using of Wire enamels based on Polyvinyl formal Insulation Materials and Initial Temperature are 30°C

Table.4. Temperature using of RTV Silicone Rubber insulator Materials and Initial Temperature are 30°C

Sr. No.	Time in minutes	Temperature (°C) of Insulator on Final stage
1	2	48
2	4	54
3	6	62
4	8	62
5	10	62

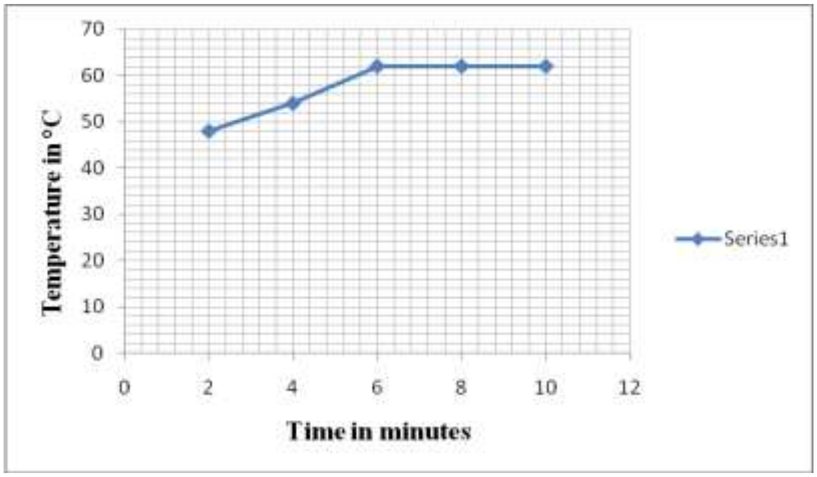

Figure 8.Temperature using of RTV Silicone Rubber Insulation Materials and Initial Temperature are 30°C

Table.5. Temperature using of Silicon-Alkyd Insulation Materials and Initial Temperature are 30°C

Sr. No.	Time in minutes	Temperature (°C) of Insulator on Final stage
1	**2**	**48**
2	**4**	**56**
3	**6**	**68**
4	**8**	**89**
5	**10**	**95**

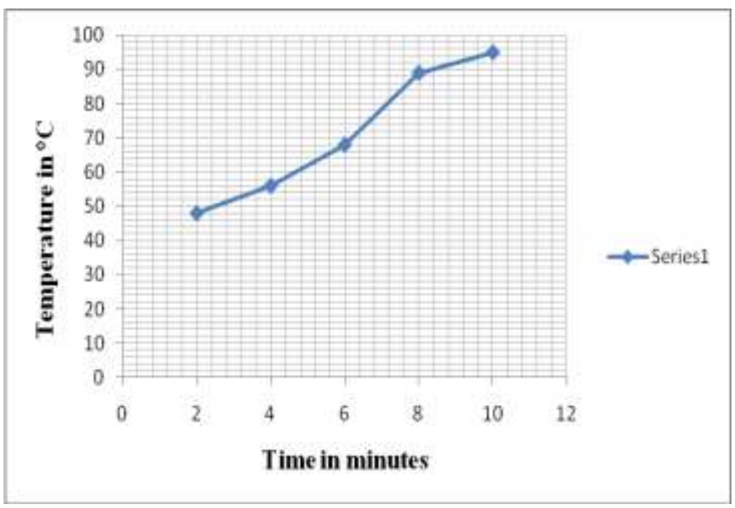

Figure 9. Temperature using of Silicon-Alkyd Insulation Materials and Initial Temperature are 30°C

CONCLUSION

Visual observations are most effective for finding the optimal static point. The life time of coated insulators can be extended by cleaning the insulators by controlled pressure water washing or by hand. By using of five type coating material we find the stable temperature when applied load 1000 watts .Find out the stable Temperature **62°C** using of **RTV Silicone Rubber Insulation** Materials and Initial Temperature are **30°C.** We can say that Silicone Rubber type coating material has best performance because of the coating material has best stable stage and Efficiency are increase of using insulator with the help of Silicone Rubber type coating.

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