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Material Optimization of Air Conditioning Capacitor

Sumit Rathod[1], Naif Borkar[2], Zishan Thakur[3], Sheetal Patel[4]

[1,2,3]Student, Department of Mechanical Engineering, Bharati Vidyapeeth College of Engineering, Navi Mumbai, India.
[4]Professor, Department of Mechanical Engineering, Bharati Vidyapeeth College of Engineering, Navi Mumbai, India.

Abstract - *A capacitor is a passive two-terminal electronic component that stores electrical energy in an electric field. A capacitor is a passive two-terminal electronic component that stores electrical energy in an electric field. It is used in Air conditioning and fan*

Key Words: Tungsten, Capacitor, Optimization, Temperature.

1. INTRODUCTION

Most are designed to last approximately 20 years, but a number of factors can cause them to wear out more quickly. If your air conditioner cycles much more rapidly than average, your capacitor is undersized (as mentioned above) or it's built from problematic parts, and the estimated life span may be greatly reduced.

1.1 Problem Definition

The most common problem that bad capacitors can cause is "hard starting." which occurs during the start of compressor, stutters trying to turn on, and then shuts off a short while later. ... In most cases of capacitor problems, such as damage or a loss of charge, the capacitor will need to be replaced and capacitors cost is a bit more.

Temperature Analysis on the capacitor could be done by varying different high melting point materials on a capacitor.

Temperature Analysis is done to determing best material for the capacitor

3. Methodology

3.1. Material Selection

Melting Point	3414°C, 6177°F, 3687 K
Boiling Point	5555°C, 10031°F, 5828 K
Density	19.3
Atomic Number	74
Atomic Mass	183.84

3.2 Information Source

Capacitors with tungsten oxide as the dielectric were prepared by electrochemical oxidation in dilute sulfuric acid of thin tungsten films deposited on glass substrates. Evaporated gold counter-electrodes were used. Tungsten capacitors did not exhibit a definite capacitance-forming voltage relationship, and the capacitance often changed markedly with time. When the inverse of the capacitance C is plotted against layer thickness d for capacitors anodized to the same voltage, the points are found to drift toward a line given by C -1 = B(d -- d o). The dielectric constant calculated from the slope B is 40. This suggests that a limited portion do of the total oxide thickness is gradually converted into relatively conductive material. Thin-film resistors have been prepared by the anodization of vacuum-deposited tungsten metal. The resistors are provided with almninum contact tabs to maintain a durable, low resistance contact. Anodization of the tungsten film forms a protective oxide layer and adjusts the metal thickness to provide precisely a desired resistance value.

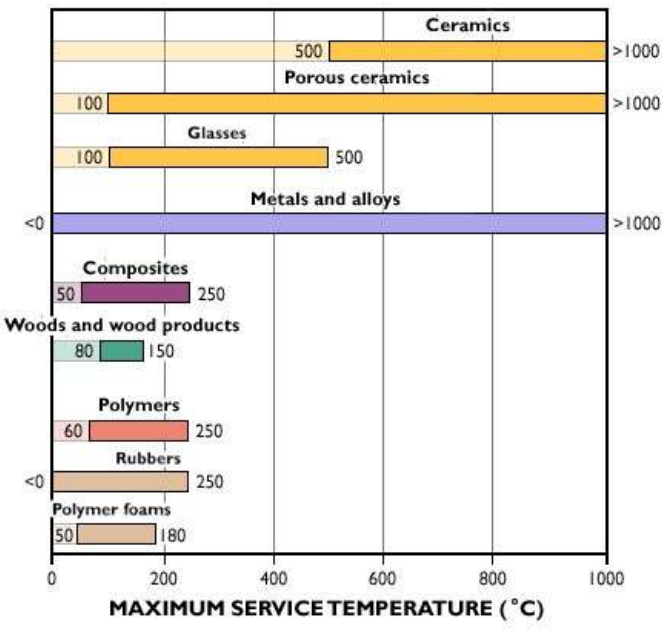

Chart -1: Name of the chart

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Fig -1: Capacitor

4. RESULT

These characteristics made tungsten an attractive choice for long life expectancy.

5. FUTURE SCOPE

To optimize the material coating of the capacitor

Optimization by considering highest melting point to sustain the life expectancy of the productuse abbreviations in the title or heads unless they are unavoidable.

6. CONCLUSIONS

To Validate the resistance of our design, we have done test on highest melting and boiling points of all the materials.

Tungsten seems to be more reliable than the other material in terms of maintenance and life expectancy of the material.

From the Analysis done it is clear that the optimal heat resistance in terms of boiling and melting point tungsten seems to be the best.

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BIOGRAPHIES

Sumit Rathod-His speciality is Production process and Mathematics

Zishan Thakur-His speciality is Industrial management and Thermal Fluid and Power Engineering

Naif Borkar- His speciality is Mechanics and Strenght of Material