MT 26
International Conference on Magnet Technology
Vancouver, Canada | 2019

Contribution ID: **1031** Type: **Poster Presentation**

# Mon-Af-Po1.23-01 [110]: Temperature Change Effects on No-Load Loss Characteristics of Amorphous Alloy Cores

*Monday 23 September 2019 14:30 (2 hours)*

Transformer is important in power system. No-load loss and apparent power of amorphous alloy transformer core change obviously with temperature. Moreover, the inner temperature varies in large scale. At present, little research has been done on no-load loss of amorphous alloy cores with temperature change. Therefore, it is very important to study the no-load loss at different temperatures.

**Temperature Change Test**

In this paper, three amorphous alloy cores of different strips are designed and manufactured based on measuring platform and scaled-down transformer core model. Measurements were carried out in the same temperature control box within range of 10-110℃. Measurements were made every 10℃from 10 ℃. When the inner box temperature reached set temperature and it was maintained stable for 10 minutes, measurements were then made after internal temperatures of amorphous alloy cores were in consistence with externals. The no-load loss and apparent power were measured respectively within 0.05T-1.4T magnetic density, meanwhile, the induced voltage and excitation current waveform were recorded.

**Conclusion**

Temperature changes may have certain effects on loss characteristics of the three types of amorphous alloy core models. When magnetic density is not saturated, as core temperature increased, the active power loss decreases by 6%-10%, and the apparent power will be reduced by about 5%. Within standard-operating magnetic density, as core temperature increases, the active power loss of core decreases by 4%-5%, while the apparent power increases by 4%-7%. When the magnetic density is supersaturated and the temperature rises, the active power loss is basically unchanged, at this point, an irregular state emerged. However, the apparent power will increase by more than 50%. Hence, the temperature change has evident effects on apparent power of amorphous alloy cores under supersaturated magnetic density.

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**Session Classification:** Mon-Af-Po1.23 - Transformers