



Q. One of your salesman talked about the fact that you test each motor you rewind for core loss. Can you explain exactly what is involved and what purpose it serves. ?

A. Testing the motor core is a very important step in the rewinding process and often determines whether we rewind or recommend replacing the motor in question.

When we say motor core we mean the entire lamination stack into which the winding is inserted . Although the winding lamination stack may appear to be a solid block of grooved steel it is in fact built up of individual thin steel laminations, called coreplate.



The picture to the left highlights this and shows in a dramatic way what happens when the rotor severely drags the lamination stack and produces a lot of damage.

There are approximately 45 laminations per inch of stack for 60 Hz service and each lamination is coated with an oxide insulation coating which effectively insulates each lamination from its neighbor. When a disaster occurs as in the picture to the left the severe rubbing of the laminations and/or arcing together of lamination segments effectively shorts out portions of the coreplate and this gives rise to what are called eddy currents and their associated electrical losses. Shorted laminations create extra heat and reduce insulation life. Every 10° C increase in temperature halves the winding insulation life, so a relatively small area of shorted laminations can drastically reduce the life of a winding.

When we do a core loss test we effectively measure the amount of damage to the coreplate.



To the left is a picture of a core loss test being carried out. The tester machine itself provides high current at low voltage to simulate operating conditions in the core. Flux, amperes and watts readings, and core dimensions are fed into the tester’s computer system which calculates watts/lb (kg) of core loss (suggested maximum of 4 Watts/lb). With parameters for “bad” , “marginal” and “good” cores, the software generates a detailed printed core condition report. Localized damage is found by increasing the excitation level to reveal hot spots within the core.

Testing can occur with the winding in place or removed. Winding condition, motor flux density and lamination grade and thickness do not significantly effect the test results.

Core loss testing can be used on the core steel of stators, rotors and armatures.

Core loss testing provides the following desired information:

- 1. It identifies motors with damaged cores that should not be repaired**
- 2. It identifies motors with damaged cores that should be repaired**
- 3. It verifies the effectiveness of the core repairs**

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