

## Lattice Network Model for Calculation of Eddy Current Losses in a Solid Permanent Magnet

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**Abstract :** Permanently excited machines are set up with magnets that are made of highly energetic magnetic materials. Inherently, the permanent magnets warm up while the machine is operating. With an increasing temperature, the electromotive force and hence the degree of efficiency decrease. The reasons for this are slot harmonics and distorted armature currents arising from frequency inverter operation. To prevent or avoid demagnetizing of the permanent magnets it is necessary to ensure that the magnets do not excessively heat up. Demagnetizations of permanent magnets are irreversible and a breakdown of the electrical machine is inevitable. For the design of an electrical machine, the knowledge of the behavior of heating under operating conditions of the permanent magnet is of crucial importance. Therefore, a calculation model is presented with which the machine designer can easily calculate the eddy current losses in the magnetic material.

**Keywords :** analytical model, eddy current, losses, lattice network, permanent magnet

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