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## **Wed-Mo-Po3.13-10 [118]: Study on The Novel Rotor Core of Induction Motor with Cross Lamination**

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The induction motor(IM) is used in a variety of fields such as home appliances and factories, automobiles and railroad cars. Therefore, each motor has different target performance and the shape of the rotor is different. Use a cage rotor(CR) when the efficiency of the IM is important, and a double cage rotor(DCR) when starting torque is important. Starting torque and efficiency are in a trade-off relationship, which is affected by rotor resistance. Lowering the rotor resistance increases the efficiency and decreases the starting torque, which is reversed when the resistance increases. Since the rotor resistance is fixed to the rotor core shape, once the mold is made, the shape and performance of the rotor core are determined. Therefore, different types of rotor cores are required to make different types of IM, and many molds are required, which greatly increases the production cost. In this paper, a new rotor core feature of IM using cross-lamination is proposed. Make CR and DCR using dissimilar molds or counterpunch. The area of the starting bar in DCR is 1/4 of the bar in CR. Since the current flows to the starting bar during startup, the resistance of the DCR is about four times that of the CR. By 1:1 the resistance of the cross-lamination rotor core is approximately 2.5 times greater than that of the CR and approximately 0.375 times less than that of the DCR. When the resistance changes, the torque-slip curve changes depending on the proportional trend characteristic of the IM. By adjusting the stacking ratio, you can select the starting torque and efficiency by adjusting the rotor resistance with the least mold. Finally, the new rotor core features proposed based on 15kw grade IM are applied variously to verify the validity of their performance through finite element analysis(FEA).

**Primary author:** Mr KIM, Dong-Ho (Gachon University)

**Co-authors:** Prof. KIM, Kwang Soo (Halla University); Prof. LEE, Sung Gu (Busan University of Foreign Studies); Dr CHO, Suyeon (KATECH); Mr YANG, In-Jun (Gachon University); Mr SONG, Si-Woo (Gachon University); Prof. KIM, Won-Ho (Gachon University)

**Presenter:** Mr KIM, Dong-Ho (Gachon University)

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