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HIGH EFFICIENCY INDUCTION ELECTRIC MOTORS FOR THE MINIMIZATION OF ENERGY LOSS AND ENVIRONMENTAL IMPACT

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Abstract

Following the current trend in fossil energy saving, emphasized both by sustainable economy principles and by environmental protection constraints, the electrical equipment producers are in competition for delivering high efficiency products on the global market. The fabrication of electrical motors is already regulated through efficiency product standards; complying with them represents a continuous tough challenge for manufacturers. The paper outlines the normative frame for developing energy efficient induction motors, it analyses categories of energy consumption during their fabrication and operation and opens several directions for the possibility of upgrading existing designs to more economical units. Two case studies are presented as illustrative examples for improving induction motor technical features, based on numerical analysis; upgraded versions of induction motors are evaluated vs. their basic (currently existing) units. An environmental impact study is finally presented; several case studies (with reference to currently used induction motors) illustrate quantitative consequences on energy consumption, carbon dioxide emissions and overall costs when different upgrading methods are applied for the improvement of these motors' design.

Key words: efficiency class, efficient electrical motor, energy savings, environmental impact

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